STATEMENT OF BASIS

U.S. DEPARTMENT OF ENERGY,

KAISER-HILL COMPANY, L.L.C.,

&

ROCKY FLATS CLOSURE SITE SERVICES, L.L.C.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

PERMIT NUMBER: CO-0001333

PERMIT RENEWAL

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1.0 FACILITY DESCRIPTION AND BACKGROUND INFORMATION

This statement of basis is for the renewal of the NPDES permit, (CO-0001333) for the U.S. Department of Energy's (DOE) Rocky Flats Environmental Technology Site (RFETS), formerly known as Rocky Flats Plant. The previous permit was issued in 1984 with a June 30, 1989 expiration date. The permit was administratively extended from that date in accordance with the provisions of 40 CFR 122.6. A draft Permit and Statement of Basis (SoB) were released for public comment in August, 1997. At that time the intent was to process and issue the permit after the close of the comment period, with an effective date of November, 1997. However, several of the issues on which the permittees commented had to do with the legal determinations on the status of radionuclide constituents under NPDES and the various ways that other regulatory authorities could be linked to the Clean Water Act. Resolution of these questions required an extended period of discussion among the various parties, and permit issuance was postponed while this process was completed.

The RFETS is part of DOE's nuclear weapons complex. It is located in unincorporated Jefferson County, about 16 miles northwest of Denver, Colorado (Figure 1 at end of statement of basis). The plant site proper is located on approximately 400 acres within an area of almost 10 square miles, which is undeveloped and forms a buffer zone surrounding the plant site. The location is on a plateau just east of the foothills of the Rocky Mountains and is at an elevation of approximately 6,000 feet. The climate is semi-arid, with an average precipitation of about 15 inches per year in the form of both rain and snow.

The RFETS is contractor-operated by Kaiser-Hill Company L.L.C. (K-H), with several subcontractors. Rocky Flats Closure Site Services, L.L.C. (RFCSS) is the subcontractor that will have primary responsibilities for operations that affect the NPDES permit. K-H assumed operator responsibility from EG&G Rocky Flats, Inc. (EG&G) on July 1, 1995. Until 1994 the main purpose of the RFETS was to fabricate and assemble nuclear weapon components for the United States Government. RFETS fabricated components for nuclear weapons from plutonium, uranium, beryllium, and stainless steel. Support activities at the RFETS included chemical recovery and purification of recyclable transuranic radionuclides, and research and development in metallurgy, machining, nondestructive testing, coatings, remote engineering, chemistry, and physics. Parts, components and sub-assemblies manufactured at this location were shipped elsewhere for final assembly. Of the approximately 180 buildings on the Plant site, roughly 54 were used and designed specifically for production and processing activities. The remaining buildings house offices and support facilities. In many respects, RFETS is similar to many large industrial facilities. It has its own water treatment plant, sewage treatment plant, fire station, and security force. Approximately 5,000 people were employed at RFETS as of July, 2000, but the number of employees has been fluctuating with mission and operational changes, and is expected to decrease gradually over the coming years, leading up to site closure.

Since 1992, RFETS has had several different missions. These missions have included (1) deactivation of currently surplus buildings, (2) short-term non-plutonium production and subsequent deactivation, (3) environmental and waste management support, (4) ongoing site support services, (5) environmental restoration, and (6) maintenance of a plutonium storage capability until alternatives are implemented. The Rocky Flats Cleanup Agreement (RFCA) signed in July, 1996 includes a vision statement for the site's future which indicates that site closure activities including facility deactivation and decommissioning, waste management, and environmental restoration will continue to be the primary RFETS mission. DOE and Kaiser Hill signed a contract in January of 2000 that calls for the cleanup and closure of the Site in the 2006/2007 time frame. Under all anticipated scenarios, RFETS will be pursuing cleanup and closure throughout the term of this permit.

The primary surface drainage from the RFETS area occurs via Walnut Creek (including South Walnut Creek and North Walnut Creek) and Woman Creek. A portion of the area is drained by Rock Creek, but that area does not receive discharges from the plant site and therefore is not considered in developing the NPDES permit (See Figures 1 and 2 at the end of this document). North and South Walnut Creeks originate within the RFETS area and combine to form Walnut Creek before leaving the site. Walnut Creek flows through Great Western Reservoir, which has historically been the raw water storage reservoir for the City of Broomfield's drinking water supply. This supply has been replaced by imported sources, and use of Great Western Reservoir after January 1, 1998, is expected to be for non-potable purposes such as irrigation and reuse storage. In 1989, the City of Broomfield constructed a ditch which allows the City to divert flows up to approximately 40 cubic feet per second (cfs) from Walnut Creek and around the reservoir.

Woman Creek originates just to the west of RFETS and flows eastward across the site. Until recently, this flow entered Standley Lake approximately 1 ½ miles east of RFETS. Standley Lake is a storage reservoir for drinking water supplies and irrigation water. It is also used for fishing and recreational purposes. Construction of the Woman Creek Reservoir between the RFETS boundary and Standley Lake now allows for the flows in Woman Creek to be retained and pumped into the adjacent Walnut Creek drainage at a point just below the Great Western Reservoir dam outlet.

There are four ponds (A-series) on North Walnut Creek, five ponds on South Walnut Creek (B-series) and one pond (C-2) adjacent to Woman Creek that are used to help regulate surface runoff and/or store contaminated waters from various sources (See Figure 2). Ponds A-1, A-2, B-1, and B-2 are "off-channel" ponds, and have been used primarily to store contaminated water and have not been regulated under an NPDES permit. Pond A-3 has historically received some surface runoff and ground water inflow that had been contaminated (primarily by nitrates) by seepage from solar evaporation ponds. Ponds A-4, B-5, and C-2 (known as the terminal ponds) were constructed in the late 1970s primarily to provide flow regulation and to provide emergency storage in the event of a significant release of pollutants that reached the surface drainage system. Pond C-2 receives storm water runoff from the southern portion of the plant site proper via the South Interceptor Ditch. Woman Creek was rerouted around the pond site when Pond C-2 was constructed and does not flow into Pond C-2 except during very high flows. The discharges from Ponds A-3, A-4, B-3, B-5, and C-2 were regulated by the previous permit, but will not be regulated by this permit, for reasons explained in Section 4.0.

Process wastewaters and other wastewaters at RFETS that may contain metals and/or radioactive pollutants are normally treated in Building 374 rather than the sewage treatment plant (STP). (A more detailed description of wastewater treatment in Building 374 is given in Section 7.0.) Currently, there is no direct discharge from Building 374. Instead, the effluent from Building 374 is used as makeup water in the cooling tower system and as boiler feedwater. Blowdown from the cooling tower system and blowdown from the steam system go to the STP.

The discharge from the STP has been and continues to be the main non-storm water discharge at RFETS. (A detailed description of the STP is given in Section 5.0.) The effluent from the STP is currently discharged to South Walnut Creek at Pond B-3. In the mid-to-late 1970s, the use of spray irrigation to dispose of the effluent from the STP was started at RFETS. The main objective was to minimize the amount of STP effluent that flowed off the RFETS property and into Great Western Reservoir. Pond B-3 was used to store the effluent, which was pumped to the spray disposal sites. In the two previous permits the point of discharge for the STP effluent was the point of discharge from Pond B-3. The previous permit required that there be no discharge from Pond B-3 except when weather conditions (precipitation, snow melt, and/or extreme low temperatures) resulted in the flow into Pond B-3 being

greater than could be handled by temporary storage in Pond B-3 and spray irrigation done in accordance with good engineering practices with the existing facilities. The discharge from Pond B-3 had to meet numerical effluent limitations.

In 1989, EPA directed DOE to stop the spray irrigation because part of the spray irrigation site was located in proximity to contaminated areas. Since then the effluent from the STP has been discharged to Pond B-3 and subsequently released downstream to Ponds B-4 and B-5. However, as discussed below, this permit renewal will move the compliance point for the STP effluent back to the point of discharge.

2.0 SIGNIFICANT EVENTS SINCE PREVIOUS PERMIT WAS ISSUED

Since the previous permit was issued in 1984 various events have occurred that directly or indirectly affect activities at RFETS. They include the following:

1. During the period of February, 1988, through May, 1988, the effluent limitations for BOD_5 and Fecal Coliforms for Outfall 001 (Pond B-3) were exceeded. Adverse weather conditions (cold and wet) limited the amount of STP effluent that could be disposed of by spray irrigation using good engineering practices. This made it necessary to discharge from Pond B-3. The cold, wet weather and the lack of adequate sludge processing capabilities at the STP contributed to the violations of the BOD_5 limitations. Table 1 lists the NPDES noncompliance situations at RFETS for the specified time period.

TABLE 1 - DESCRIPTION OF NONCOMPLIANCE SITUATIONS

Parameter	Period	Permit Limit		Results	
		Avg.	Max.	Avg.	Max.
BOD_5, mg/L	Feb. 1988	10	25	11	N/A b/
	Mar. 1988	10	25	21.3	28.5
	Apr. 1988	10	25	<27	<40
	May. 1988	10	25	11.3	N/A
Fecals/100 ml	Apr. 1988	200	400 a/	312	N/A

a/ 7-day average (geometric mean)
b/ Not Available

2. On February 24, 1989, there was a chromic acid spill in a metal finishing operation that ultimately resulted in significant quantities of chromium reaching the STP. The resulting high chromium concentrations in the STP upset the biological treatment process, with upset conditions lasting approximately two weeks. The chromium contaminated water went from the STP to pond B-3, where it was then spray-irrigated onto a land application site.

3. As a result of the chromic acid spill and the violations of the effluent limitations on BOD_5 and fecal coliforms, EPA and DOE entered into a Federal Facilities Compliance Agreement (FFCA), which was signed in March, 1991. The FFCA included the following requirements for RFETS:

a. Compliance for Outfall 001 (Discharge from Pond B-3) would be determined from the sewage treatment plant.

b. Chromium limits of 0.05 mg/L, protective of drinking water standards, would be applied, on Outfalls 005 (Pond A-4), 006 (Pond B-5) and 007 (Pond C-2).

c. Whole effluent toxicity (WET) testing would be imposed on the discharges from the STP and Ponds A-4, B-5, and C-2.

d. A plan and schedule to address past effluent violations of BOD (Biological Oxygen Demand) and Fecal Coliform permit limits and for prevention of future incidents similar to the chromic acid incident of February 1989.

e. Proper sludge handling and disposal practices at the facility would be implemented. DOE agreed to conduct a study of the impact of the unlined sludge drying beds on the vadose zone beneath the beds.

4. In June 1989, agents of the Federal Bureau of Investigation (FBI) and EPA executed a search warrant to investigate alleged violations of federal environmental laws and other regulations at RFETS. There was a subsequent grand jury investigation and Rockwell International, the RFETS contractor at the time, agreed to pay penalties of about 18 million dollars for violations of Resource and Conservation Recovery Act (RCRA) and the Clean Water Act (CWA).

5. In June 1989, the State of Colorado and DOE signed the Agreement in Principle (AIP) which governs the monitoring and assessment of terminal ponds prior to discharge, among other items. This agreement was reissued in April of 1995, and remained in effect until December, 1999. A new agreement is currently being negotiated to replace the AIP. Under the AIP, the Colorado Department of Health (CDH) (now the Colorado Department of Public Health and Environment (CDPHE)) was empowered to perform independent testing and analysis for inorganic and organic chemicals and radionuclides in RFETS ponds before any water is discharged. Until RFCA was signed, approval was given by CDPHE for discharges from the terminal ponds. Under RFCA, RFETS makes discharge decisions after evaluation of the pond data.

6. In 1989, Rocky Flats (RFETS) was added to the National Priorities List for cleanup under the Federal Superfund Program. Studies and corrective actions are underway at RFETS. Section 121(e)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) states "No Federal, State or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section." Accordingly, discharges from corrective actions under CERCLA at RFETS are not regulated by an NPDES permit.

7. During the summer of 1989, the City of Broomfield constructed a ditch around Great Western Reservoir, which allows the City to divert flows up to approximately 40 cubic feet per second (cfs) from Walnut Creek and discharge the water to Walnut Creek just downstream of Great Western Reservoir. About the same time, the City of Westminster began diverting the water released from Pond C-2 (to Woman Creek) around Standley Lake, using an existing system of ditches. This practice was continued until DOE had a

temporary pipeline constructed from Pond C-2 to the diversion ditch around Great Western Reservoir. Water from Pond C-2 was then released to the diversion ditch as necessary. The pumping was discontinued and the pipeline removed upon completion of Woman Creek Reservoir in 1996. Since then, water from Pond C-2 has entered Woman Creek Reservoir.

8. In 1989, atrazine, a herbicide, was detected in the waters in Ponds A-4 and B-5. Portable granular activated carbon (GAC) units were installed at Ponds A-4, B-5, and C-2 to treat the water prior to discharge. Later, the GAC unit at Pond B-5 was moved to Pond A-4 and water from Pond B-5 was pumped to Pond A-4 for treatment and subsequent discharge. The use of atrazine was discontinued at RFETS and after a period of time atrazine was no longer detected in the terminal ponds. Subsequently, the use of the GAC units was stopped.

9. In order to fulfill the requirement in the AIP that the State of Colorado "perform representative sampling of the pond system," the State requested to DOE that the water from Pond B-5 continue to be discharged through Pond A-4 and that an isolation and batch type of operation be used. Based on this request, the normal operating procedure for discharging water from Ponds A-4 and B-5 was to pump water from B-5 to A-4 and to discharge it from A-4. Under this operating scheme, before water is discharged from A-4, the flow into A-4 from A-3 and B-5 was stopped, a sample taken from A-4 and analyzed. If the quality of the sample is acceptable, a discharge from A-4 is initiated. During periods of heavy and/or prolonged runoff, it has often been necessary to discharge directly from B-5 in addition to discharging from A-4. Under these conditions, it has often necessary for DOE to begin pond discharge prior to receiving the results of the pre-discharge samples.

10. In 1989, the RCRA program required that the disposal of the effluent from the STP by land application be terminated, based on the fact that part of the land application site was located over an old landfill at RFETS.

11. In 1991, DOE, the Colorado Department of Health (CDH), and EPA signed an Interagency Agreement, which outlined schedules for environmental restoration at RFETS.

12. On June 26, 1992, EPA notified DOE in writing that Ponds A-3, A-4, B-3, B-5, and C-2 are located in waters of the United States and after extensive review EPA had determined that the discharges from these ponds will not be considered point source discharges requiring a NPDES permit. The renewal permit for the RFETS will not include the discharges from these ponds. This approach was incorporated into the RFCA, which establishes that the CERCLA and the RCRA programs will be used to regulate and control the discharges from these ponds. The renewal NPDES permit will regulate the discharges from the sewage treatment plant and the storm water discharges from the RFETS site prior to entry into Walnut Creek and Woman Creek or into the ponds.

13. On August 16, 1993, EPA notified DOE and EG&G that both of them would be co-permittees instead of DOE being the permittee. The signed application form was submitted to EPA on October 18, 1993.

14. On July 1, 1995, K-H replaced EG&G as the main contractor at RFETS. On June 30, 1995, EG&G, K-H, and RFCSS submitted a request that EPA substitute K-H and RFCSS

for EG&G as co-applicants with DOE for renewal of NPDES permit number CO-0001333 and remove EG&G as a co-applicant from such applicants.

15. During late 1995 and early 1996, representatives from DOE, EPA, CDPHE, and KH conducted an extended series of negotiations with the goal of establishing a new three-party agreement to guide cleanup activities at RFETS. This agreement was written to replace the 1991 IAG and be consistent with the new site mission, incorporate lessons learned, focus activities on a discrete set of mutual objectives, and reflect the alterations in downstream water uses and standards. The Rocky Flats Cleanup Agreement (RFCA) was signed in July, 1996, with DOE, EPA, and CDPHE as signatories.

16. In late 1996, the Cities that obtain their drinking water supply from Standley Lake completed construction on a project to retain the Woman Creek flows in a new reservoir and convey that water to the diversion ditch around Great Western Reservoir.

17. As of January, 1997, the City of Broomfield had acquired a different source of water for its drinking water supply and was proceeding with a plan to no longer use Great Western Reservoir as a drinking water supply. The new system became operational in July of 1997. At that time, the Broomfield drinking water supply no longer included any water associated with RFETS.

18. On January 1, 1998, additional temporary modifications (nitrate/nitrite) took effect on segments 4b and 5 of Big Dry Creek. These modifications were included in the Colorado Water Quality Control Commission rulemaking of January 21, 1997, but were given a delayed effective date to allow for the discontinuation of the use of Great Western Reservoir as a drinking water source. The necessary changes in water supplies were completed, and the temporary modifications took effect as scheduled.

19. In August, 1997, EPA issued a draft NPDES permit. This draft allowed for the construction, by the permittees, of a second discharge point for sewage treatment plant effluent at a location on Walnut Creek downstream from Pond B5. This second discharge point was designated STP2.

20. In October, 1997, the Site Permittees submitted updated form 2C information and data tables which included more recent statistics and monitoring results for the STP effluent and various influent wastewater streams. This information is included in section 4 of this addendum.

21. On November 14, 1997, CDPHE issued a 401 certification for the draft permit. This certification was conditioned on discharge limits for radionuclides at the STP either being included in the permit or explicitly added to RFCA.

22. On January 28, 1998, DOE appealed the CDPHE 401 certification for the draft permit on the grounds that the State does not have authority to impose water quality discharge limits for radionuclides at the Site.

23. During 1998 and early 1999, EPA conducted ongoing consultations with CDPHE and the Site permittees regarding the preferred approach for regulation of radionuclides that may be discharged from the STP. The aim of these talks was to find a way of utilizing

CERCLA authority to provide regulation of these constituents under RFCA (as contained in the draft permit) while making certain alterations in RFCA language and cross-references were needed to effectively implement this approach.

24. In May, 1998, the U.S. Department of Interior Fish and Wildlife Service listed the Preble's Meadow Jumping Mouse as a threatened species under the Endangered Species Act. This mouse is known to exist in various riparian areas at the Site, including in the reach of South Walnut Creek between ponds B-3 and B-5. Flows and flow patterns in this reach would have been altered by the change in discharge points anticipated to take place under the draft permit.

25. During 1998, the Site permittees in a cooperative effort with the City of Broomfield designed and constructed an extension of the McKay Ditch, which eliminated the necessity to commingle water Broomfield imports from other sources with flows in Walnut Creek--and therefore the treated STP effluent--when delivering these flows to Great Western Reservoir. Construction of this project was completed in early 1999. Subsequent to the completion of this project, EPA, CDPHE and DOE, in consultation with downstream water, users agreed that instead of pumping water from Pond B-5 to Pond A-4, water could be directly discharged from Pond B-5.

26. In the Spring of 1999, the Site permittees decided to drop plans to construct a new discharge line from the STP, thus eliminating the need for discharge point STP2. Under the new closure planning assumptions, the STP will discontinue operations by 2004. Given this, the construction expense for the new line was found to be unjustified. This change simplified the circumstances surrounding the CDPHE certification dispute, and eventually lead to a proposed settlement agreement being offered in November of 1999.

27. Upon issuance of this permit, EPA anticipates that DOE and the State of Colorado will sign a settlement agreement which resolves DOE's appeal of the CDPHE conditional certification. This action will clear the way for State certification without the disputed conditions, thus allowing for issuance of the NPDES permit.

28. In the fall of 1999, DOE installed a ground water collection system coupled with a passive reactor to treat nitrate and uranium contamination flowing from the former solar evaporation ponds. This system replaces the Interceptor Trench System which the Site began installing in 1970 to collect and treat this contaminated ground water. The solar ponds have been the source of most of the nitrate contamination at the site. The former ponds are located in the northeast portion of the protected area. They were operated primarily to store and evaporate radioactive process wastes and neutralized acidic process wastes containing high levels of nitrate and aluminum hydroxide from 1953 to 1986. Contaminated ground water from the solar ponds has migrated northward down the hillside and into North Walnut Creek. EPA and CDPHE are regulating the new ground water collection system under the RFCA. Effluent from the STP is expected to account for only about 25% of the site's total nitrate loading.

3.0 STATE OF COLORADO WATER QUALITY STANDARDS

The receiving waters for the discharges from RFETS are part of the Big Dry Creek Basin, which is a tributary to the South Platte River Basin. For purposes of assigning stream use classifications and assigning numerical water quality standards, the Colorado Water Quality Control Commission (Commission) divided Big Dry Creek Basin into six different segments. The description of the stream segments and the corresponding use classifications are given below in Table 2. It should be noted that segments 1, 4, 5, and 6 are use protected, which means the antidegradation review requirements of Colorado's water quality standards do not apply to these segments. The stream segment descriptions, the use classifications, and the numerical water quality standards are based on the March 11, 1993, June 12, 1995, and January, 1997 actions by the Commission.

In its January 1997 action, the Commission established new basic (statewide) standards for plutonium and americium and temporary modifications for nitrate/nitrite and several organic compounds. Some of the changes to standards established by the January 1997 commission action had an effective date of January 1, 1998. This was to ensure that the action allowed time for discontinuing the use of Great Western Reservoir as a drinking water source, which was an important factor in the basis for the changes. Table 2 shows classifications in effect as of January, 1998.

The specific numerical water quality standards for segments 1-5 are given in the Commission's Notice of Final Adoption dated January 21, 1997. The numerical standards for several of the heavy metals have to be calculated using the appropriate hardness for water. In calculating these standards for segments 4 and 5 of the Big Dry Creek Basis, a hardness of 143 mg/L was used. That hardness value was taken from a preliminary evaluation by EG&G of water quality standards for development of an IM/IRA for operation of the ponds at the RFETS.

TABLE 2
STREAM SEGMENTS OF BIG DRY CREEK BASIN

Segment	Stream Segment Description	Classification (1/1/98)
1	Mainstem of Big Dry Creek, including all tributaries, lakes, and reservoirs, from the source to the confluence with the South Platte River, except for specific listings in Segments 2, 3, 4a & b, 5 and 6.	Aq Life Warm 2 Recreation 2 Agriculture
2	Standley Lake	Aq Life Warm 1 Recreation 1 Water Supply Agriculture
3	Great Western Reservoir	Aq Life Warm 2 Recreation 2 Water Supply Agriculture
4	Mainstem and all tributaries to Woman and Walnut Creeks from sources to Standley Lake and Great Western Reservoir, except for specific listings in Segment 5. a/	Aq Life Warm 2 Recreation 2 Water Supply Agriculture
5	Mainstems of North and South Walnut Creek, including all tributaries, lakes, and reservoirs, from their sources to the outlets of ponds A-4 and B-5 on Walnut Creek, and Pond C-5 on Woman Creek. All three ponds are located on RFETS.	Aq Life Warm 2 Recreation 2 Water Supply Agriculture
6	Upper Big Dry Creek and South Upper Big Dry Creek, from their sources to Standley Lake	Aq Life Warm 2 Recreation 2 Water Supply Agriculture

a/ On June 12, 1995, the Colorado Water Quality Control Commission resegmented portions of segment 4 of Big Dry Creek into segments 4a and 4b, such that the North and South Walnut Creek and Walnut Creek, from the outlet of Ponds A-4 and B-5 to Indiana Street, now constitute segment 4b, with the remainder of the former segment 4 now designated as segment 4a. The use classifications did not change.

4.0 SIGNIFICANT CHANGES IN THIS PERMIT FROM THE AUGUST 1997 DRAFT PERMIT

Several significant changes have been made in the permit which was released for public comment. A description of these changes and the reasons they were made is given below. In addition, a large number of corrections, clarifications, and minor additions were made to the text and tables in the permit and the SOB in response to specific written comments submitted to EPA by CDPHE, the permittees, and local governments.

The draft permit showed that effluent limitations for nitrate/nitrite and silver would change during the term of the permit due to temporary modifications of stream standards taking effect. These changes are now in effect and will remain so beyond the term of the permit, so the permit has been altered to reflect this. Although the temporary modifications for organics apply only in segment 5, only one set of values is now shown in the effluent limitations table, due to the elimination of the second STP discharge point (STP2).

Several commentors raised the concern that the STP effluent data was out of date, and one noted that the data that was provided with the draft SoB appeared to indicate a possible problem with the plant meeting effluent limitations for selenium and thallium. The updated data indicates that some of the previous data may have been erroneous or that the values were indicative of analytical problems. In any case, more recent data show that the STP can consistently meet these limits.

With regards to radionuclide constituents and how they are addressed in the permit, changes have been made in the discharge point descriptions, the effluent limitations table, and the monitoring requirements table and associated footnotes. These changes are designed to more clearly specify how the STP discharge will be monitored for radionuclides, and how the monitoring information will be transferred to the jurisdiction of RFCA. Supporting language will be added to the Action Level Framework (RFCA Attachment 5), and Footnote n of the Monitoring Requirements table in the Permit has been modified to reference this language.

The listing of the Preble's Meadow Jumping Mouse as a threatened species will require heightened attention to providing protection for this species and its habitat at RFETS. This species is known to live in riparian areas, and alterations in stream flow patterns may indirectly harm the mouse by degrading its habitat. Possible impacts on STP operations should be limited due to the elimination of the STP2 discharge point, but will be evaluated as they arise during the term of the permit.

Finally, CDPHE and other parties expressed a concern that cleanup activities within the industrial area of RFETS, being of an undetermined nature at this point, may result in influent loadings of a type or concentration that is incompatible with the existing treatment processes reaching the STP. Recognizing this concern, EPA chose to add a reopener provision to the permit that would allow for the terms of the permit to be reevaluated if evidence indicates that problems of this nature may occur.

Several additional changes were necessary to bring the draft permit up to date with regulatory requirements. These are as follows:

1. In Part I.A. the definition of "Daily Maximum" was changed so as to reflect the definitions of "Maximum daily discharge limitation" and "Daily discharge" in the NPDES regulations (40CFR122.2).

2. In Part I.C.14., Ammonia Study Requirements, the public notice draft did not have a date for submitting the annual report. For purposes of clarification, it has been specified that the report shall be for the calendar year and the report shall be submitted by March 31 of the following year. The first report is due March 31, 2001.

3. In Part III.B., Penalties for Violations of Permit Conditions, the amount of civil penalties were increased to correspond to EPA action taken as the result of the Federal Civil Penalties Inflation Adjustment Act of 1996. A brief explanation of the changes is given at

the start of this part. In addition, some language from the NPDES regulations (40CFR122.41(a)(1) that was not included in the draft permit was added.

4.1 SIGNIFICANT CHANGES IN THIS PERMIT FROM 1984 PERMIT

Several significant changes have been made from the previous permit to this permit. Those changes and the reasons for the changes are given below:

1. DOE, K-H, and RFCSS will be co-permittees. DOE alone submitted the original permit application. The NPDES regulations (40 CFR 122.21(b)) specify "When a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit." However, the original permit and subsequent permits until now were issued to DOE because DOE controlled the funding at RFETS and approval authority of activities at RFETS. Actual experience showed that this was not adequate and that the operator also needed to be held directly responsible for compliance with permit conditions. This is also consistent with the NPDES regulations. Although DOE is not the operator at RFETS, it must be a co-permittee since DOE still controls funding at RFETS. Both K-H and RFCSS will be co-permittees since K-H is the main contractor and RFCSS is the subcontractor involved with the day-to-day control of the discharges at RFETS. This co-permittee approach has been used by Region VI of EPA in the permitting of DOE's facility at Los Alamos, New Mexico.

2. The previous permit regulated the discharges from Ponds A-3, A-4, B-3, B-5, and C-2 and potential discharges from the reverse osmosis building and from a portable pilot reverse osmosis unit. The December 1988 permit renewal application did not include the discharges from the reverse osmosis units. After careful review, EPA has determined that the ponds are located in waters of the United States and that the discharges from these ponds will not be considered point source discharges requiring an NPDES permit. The renewal permit for the RFETS will not include the discharges from these ponds. Instead, discharges from these ponds will be regulated and controlled through CERCLA and RCRA, as specified by agreement in the RFCA. The renewal NPDES permit will regulate the discharges from the sewage treatment plant and the storm water discharges from the RFETS site prior to entry into Walnut Creek and Woman Creek or into the ponds.

   The determination that the ponds were located in waters of the United States and that discharges from the ponds should not be regulated under the renewal permit is based on the following:

   a. The three terminal ponds at RFETS, Ponds A-4, B-5, and C-2, were constructed primarily for flow equalization and to provide emergency containment in the event of a significant release of pollutants that reached the surface waters at RFETS. The terminal ponds were not designed as waste treatment systems. The ponds do provide some incidental treatment, primarily settling of suspended solids, but they were not designed for that purpose;

   b. The stream channels are used to convey the storm water runoff to Ponds A-3, A-4, and B-5. We recognize that the water in Pond B-5 has been transferred to Pond A-4 via a pipeline in the past, but Pond A-4 also receives storm water runoff from upstream;

c. The State of Colorado has classified all of the involved stream segments, including all of the ponds, for beneficial uses and has assigned specific numerical water quality standards to all of them (Big Dry Creek, Segment 5). Although Woman Creek has been diverted around Pond C-2, the pond has still been classified by the State. (Note: The South Interceptor Ditch (SID), which conveys the storm water runoff from a portion of the plant site to Pond C-2, was not classified by the State of Colorado and for purposes of this permit is not considered to be waters of the United States.) The NPDES permit program must address applicable water quality standards. Therefore, at RFETS, the NPDES permit must regulate the discharges going to the ponds instead of the discharges from the ponds; and

d. The renewal permit will regulate the discharge from the STP at the STP and the storm water discharges from the areas described in the application (Form 2F) submitted on October 1, 1992. The direct discharges that will be regulated by this permit are given below.

Outfall Serial Numbers	Description of Discharge Points
STP1	The outfall from the sewage treatment plant (STP), located at Building 995, prior to the mixture with the receiving stream, known as South Walnut Creek, at the point of discharge into Pond B-3 (Big Dry Creek Segment 5). Use of STP1 as the primary discharge point is expected to continue throughout the remaining life of the STP.
008	The storm water discharge from the area outlined on Sheet 2 (Basin SW022) of the maps in the Form 2F application submitted October 1, 1992, located at the point where Central Avenue Ditch crosses the outer industrial area security fence.
009	The storm water discharge from the area outlined on sheet 3 (Basin SW023) of the maps in the Form 2F application submitted October 1, 1992, located on South Walnut Creek upstream of Pond B-1, at the same location as gaging station GS-10.
010	The storm water discharge from the area outlined on Sheet 4 (Basin SW027) of the maps in the Form 2F application submitted October 1, 1992, located at the downstream end of the south interceptor ditch.
011	The storm water discharge from the area outlined on Sheet 5 (Basin SW093) of the maps in the Form 2F application submitted October 1, 1992, located on North Walnut Creek at a point upstream of Pond A-1. This area receives any storm water discharge from Outfall 012.
014	See No. 3 Below.

See Figure 3 for general outline of storm water drainage basins.

3. The permit will include internal effluent limitations and monitoring requirements on the product water from the evaporator in Building 374. The product water from this evaporator is used as makeup water in the cooling tower system and as boiler feedwater. The blowdown from the cooling tower system and the boiler blowdown are discharged to the sanitary sewer system and ultimately discharged from the STP. To date Building 374, including the discharge from the evaporator has been regulated under the RCRA program. With the termination of manufacturing operations at RFETS, it is possible that 'hazardous wastes' are no longer being sent to Building 374 and that the discharge from the evaporator may no longer be regulated under RCRA. In order to insure that the water being discharged from the evaporator has received adequate treatment, this indirect discharge will be regulated as an internal waste stream under the provisions of 40 CFR 122.45(h) and will be identified as Outfall 014.

4. Because of the change in the water quality standards of the receiving waters for the discharges at the RFETS, the discharge from the STP will include effluent limitations for many more pollutants, including gross alpha and gross beta. The permit will not have effluent limitations or monitoring requirements for the radionuclides americium, plutonium, tritium, and uranium. These radionuclides will be monitored for and regulated under the RFCA. An explanation of why the permit does not include effluent limitations on the radionuclides is given in Section 8.1.

5. Other storm water and ground water inflows to the creeks which introduce contaminants to the surface waters include flows such as the landfill seep, other seeps in the mound/trenches areas, and overland flow from areas of surface contamination in the buffer zone. These types of inflows are regulated by application or action levels and/or standards under RFCA. Storm water outfalls are designated in this permit. However, monitoring, source identification, mitigation and other requirements for these outfalls are deferred, to be covered by the associated provisions of RFCA. This permit does contain the applicable requirements of 40 CFR 402 for storm water, such as BMPs and storm water management plan requirements.

6. There are no effluent limitations for nitrate in this permit. The nitrate limits have been dropped for the following reasons:

   a. Encouraging nitrification. In order to minimize the impact of ammonia on aquatic life in this stream segment of Big Dry Creek, the facility should be encouraged to nitrify ammonia at the STP. Nitrifying ammonia will increase the amount of nitrate in the discharge, because ammonia-N would be converted to nitrate-N. This will not affect the total nitrogen released from the plant; it will merely change the speciation of the nitrogen. Nitrogen as nitrate is less likely to cause toxicity than is nitrogen as ammonia. (Toxicity is controlled in the renewal permit by (i) an immediate prohibition of acute toxicity from Outfall STP1, (ii) a prohibition of chronic toxicity from Outfall STP1, taking effect three years from the effective date of the permit, and (iii) a modification provision relating to toxicity.)

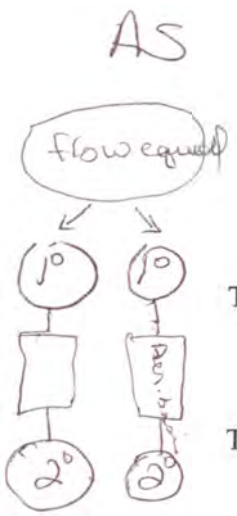
   b. Different discharge points/additions to facility. The 1984 permit included various effluent limits for nitrates, depending on the discharge points. It had no

numeric limits on nitrates in discharges from the three "terminal ponds" (which were Pond A-4 to North Walnut Creek, Pond B-5 to South Walnut Creek, and Pond C-2, to Woman Creek). It had numeric limits on discharges from Pond A-3 (as well as from Pond B-3 and from the Reverse Osmosis Plant). Pond A-3 historically has received some surface water runoff and ground water inflow that was contaminated by seepage of nitrates from the former solar evaporation ponds. As mentioned above, a ground water collection system has been installed, in accordance with RFCA, to control the nitrate contamination originating from the former solar evaporation ponds. If this system proves to be ineffective as a remedy for the nitrate contamination, the Site will take the necessary actions, in accordance with RFCA, to address the problem. This permit no longer includes any discharge point from Pond A-3.

In addition, the permit contains a provision allowing for the permit to be modified, as appropriate, in the event the sum concentrations of nitrate, nitrite, and ammonia at STP1 exceeds historic levels (see Part IV.O.7).

5.0 DESCRIPTION OF THE SEWAGE TREATMENT PLANT

The sewage treatment plant (STP) at RFETS was first placed into service in 1952 to treat the sanitary wastes from RFETS. The current treatment process includes flow equalization; dual train, continuous flow activated sludge process; and tertiary treatment. The current design flow is 0.5 million gallons per day (MGD). See Figure 4 for schematic of the STP. All of the treatment units, except for flow equalization, are located at Building 995. The flow equalization is provided by two 60,000 gallon capacity basins located in Building 990, which is located within the Protected Area (PA) at RFETS. (Note: The PA is high security area with limited access.) Two 12 inch pipelines carry sanitary waste to Building 990; one main serves the PA, while the other carries waste from outside of the PA. Normally, only one equalization basin is in service, with the second held in stand-by in the event that the extra capacity is required. Influent storage tanks constructed and put on-line in 1997 increased flow equalization capacity to 450,000 total gallons (120,000 gallons in Building 990 and 330,000 gallons at Building 995). Building 990 will be placed in stand-by condition for activation in the event of a spill.



The activated sludge process has two parallel trains each comprising a primary clarifier, aeration basin, and secondary clarifier. Average weekday flow is approximately 0.15 MGD, so only one treatment train is kept in operation, with the other train in stand-by mode.

The tertiary treatment portion of the treatment system includes chemical addition, clarification, and filtration with pressure sand filters. The chemical addition presently consists of lime for phosphorus removal and a polymer to improve settling. Previously, alum had been used instead of lime. Following the sand filters, the effluent is disinfected. The method of disinfection has been converted from chlorination to UV treatment. A new building houses the Ultratech ultraviolet light and control system. The unit contains 84 UV lamps, and is sized to accommodate 400,000 GPD flow with no more than 30 mg/L of both TSS and BOD_5

In addition to the influent basins, a 550,000-gallon-effluent storage basin in 1997 as part of the NPDES FFCA upgrades. In the event of a spill or off-normal occurrence, wastewater treatment plant (WWTP) effluent can be directed into storage until the event is resolved. The combination of influent and effluent storage will provide up to approximately four days of storage capacity.

Primary and secondary sludge is digested anaerobically, followed by dewatering in a 0.7-meter-belt filter press with final drying in the sludge drying beds. Dried sludge is packaged and stored for possible shipment off site in lieu of proposed on-site disposal management such as land application or disposal to the Site's landfill. The Site provides annual reports on sludge quantity and quality as required at 40 CFR 503. An indirect-heated dryer was included in the original sludge treatment upgrade. Operation of the dryer proved problematic and was discontinued in favor of the final drying step in the lined beds.

Until 1990, a single operator was responsible for the sewage treatment plant, generally working the day shift, but available at alternate times as conditions required. In mid-1990, five additional operators were added to the staff to provide full coverage of plant operations 24-hours per day. Supervisory and management positions were also created for support of the additional staff. Full time operator coverage of the STP was instituted as a measure against spills and to provide immediate response in the event of plant upsets.

In addition to increased staff, there have been several instrumentation upgrades at the STP which will allow for more accurate measurements and testing of the influent and effluent. Influent instrumentation includes new flow-monitoring equipment, real-time monitoring of pH, conductivity and lower explosive level (LEL) at both the equalization basins and the headworks of the STP, and a Programmable Logic Controller (PLC) which provides centralized monitoring of all instrumentation. Effluent instrumentation includes new flow monitoring equipment, and interconnection with the PLC. The real time monitoring originally included an on-line respirometer, which sampled the influent and monitored oxygen uptake rates by activated sludge organisms using the aeration basin mixed liquor. This provided an indication of the quality of the influent entering the STP. However, there were problems with plugging in the on-line respirometer, so it has been replaced with a respirometer that runs one sample at a time. Normally one sample is run per shift. RFETS is evaluating the measurement of toxicity through the use of the Microtox test at monitoring points throughout the sanitary sewage collection system, as well as other surface waters at RFETS. Other corrective actions taken at the STP include the following:

1. Replace baffles in chlorine detention tank basin to increase residence time and control fecal coliform in the discharge. This was completed by 1988. (Note: chlorination disinfection has been replaced by ultraviolet disinfection)

2. Relocate effluent sampler from a potentially contaminated site to the end of the chlorine contact basin. New ISCO sample pump (composite) installed July 1988. (Note: chlorination disinfection has been replaced by ultraviolet disinfection)

3. Install dechlorination facility, which was completed in March, 1991. (Note: chlorination disinfection has been replaced by ultraviolet disinfection)

4. Convert one STP drying bed from sand to polyurethane tile. This was completed October 1992.

5. All of the sludge drying beds at Building 995 have been lined and the sludge drying beds at Building 910 are not being used.

In addition to sanitary sewage, the STP receives cooling tower blowdown, boiler blowdown, and miscellaneous wastes from various buildings at RFETS. A March 15, 1993, information submittal by RFETS included a list of internal waste streams that go to the STP. That list is given in Appendix 1. Many of the non-cooling water sources are shops or vehicle maintenance areas. In December of 1995, wastewaters from on-site laundry operations, which average 6,000 gpd were rerouted from building 374 to the STP. With the termination of production at the RFETS and the transfer of some of the duties in Building 460 to another DOE facility, the volume of wastewater coming from that building should decrease significantly. However, some evidence indicates that infiltration and inflow to the collection system may be contributing to an increasing trend in flow.

Part III.I. of the permit requires that the Director be notified as soon as possible of any planned alterations or additions of non-sanitary wastewaters going to the STP or Building 374 that could significantly change the nature or quantity of pollutants discharged. In addition, the permittees shall submit to both EPA and the State of Colorado an annual report summarizing the status of non-sanitary wastewaters going to the sewage treatment plant or to Building 374. For each wastewater stream, the report shall list the Building from which the wastewater originates; briefly describe the nature of the wastewater; briefly describe any pretreatment of the wastewater; and give the approximate annual volume of wastewater, in gallons. This reporting shall include an estimate of infiltration and inflow, and an evaluation of the possible detrimental effect of this dilution on the treatment system performance.

6.0 EFFLUENT DATA FOR THE SEWAGE TREATMENT PLANT

Information on the quality of the STP effluent was obtained from the routine monitoring required by the permit and FFCA and from the permit renewal application. A summary of monitoring results for the traditional pollutants and chromium at the STP for 1994, along with the applicable effluent limitations for those pollutants, is given in Table 3. Except for one high value for total residual chlorine, the monitoring results were within effluent limitations during that period.

Since the draft Statement of Basis was issued, the effluent data and other information presented in the Appendices has been updated to cover the period 1995-1996. This and additional information on recent changes in the STP, such as the influent/effluent tanks and the new disinfection system are included in an updated form 2C submitted in October 1997. Data from this submittal is included in the addendum attached to this Statement of Basis.

TABLE 3
Comparison of Effluent Limitations with Monitoring Results, 1994

Parameter	Effluent Limits a/	Monitoring Results b/
$CBOD_5$, mg/L, c/	10/N/25 c/	7.2/N/13.2
Total Suspended Solids, mg/L	30/45/N	12/24/N
Fecal Coliform, No./100 mL	200/400/N e/	5/19/N e/
pH, su	6.0-9.0 d/	6.4-7.55 d/
Total Residual Chlorine, mg/L	N/N/0.5	0.13/N/0.7
Flow, MGD	N/N/N	0.16/N/0.26
Phosphorus, Total, mg/L	8/N/12	6.5/N/10.7
Chromium, Total, ug/L	50/N/100	5/N/8.5
Oil and Grease, mg/L and visual	N/N/10 No visible sheen	Analytical monitoring not required when no sheen.

a/ The effluent limitations are arranged by 30-day average, 7-day average, and daily maximum. "N" indicates no limitation.

b/ The largest values reported for 1994 are listed and arranged by the largest 30-day average, the largest 7-day average, and the largest daily maximum value reported for that parameter. For pH, the minimum and maximum values reported are listed. "N" indicates no value applicable (e.g., no 30-day average).

c/ The effluent limitations in the previous permit were for BOD_5, but the permittee was subsequently required by the Federal Facility Compliance Agreement to monitor for $CBOD_5$ instead of BOD_5.

d/ The pH values are minimums and maximums.

e/ Fecal coliform values are geometric means.

The FFCA required monitoring for metals and volatile organics in the discharge from the STP. The results of the FFCA required monitoring for metals (chromium required by permit, not FFCA) during 1994 are listed in Appendix 2. The concentrations of the metals are relatively low and in the expected range of a typical sewage treatment plant effluent.

With the exception of chloroform, the results of the FFCA required monitoring for volatile organics were reported as the concentrations being less than either 5 or 10 ug/L. For 1994, the reported concentrations of chloroform ranged from a low of 1 ug/L to a high of 5 ug/L. The reported concentrations of chloroform for 1993 ranged from 3 ug/L to 15 ug/L. The

presence of chloroform is believed to be due to the use of chlorine in the disinfection process, which is being discontinued.

A summary of the whole effluent toxicity (WET) monitoring data for the STP for 1996 through the first half of 1999 is given in Appendix 3. These data indicate periodic problems with acute toxicity.

DOE submitted an application for permit renewal on December 27, 1988. On March 15, 1993, DOE submitted an informational copy of an updated NPDES permit application (Form 2C). It was for information purposes only and was not a formal submittal. Appendix 5 contains a summary of the data for the STP from the December 1988 and the March 1993 submittals. Most of the data for the December 1988 submittal for the STP were based on one sample only. The previous permit had the authorized discharge point as the outfall from Pond B-3 and most of the self-monitoring had been done at that point instead of at the STP. Shortly before the application was due, EPA had indicated that the discharge point would be moved back to the STP in the renewal permit. The data for the March 1993 submittal were based on many more samples than in the December 1988 submittal. For metals, there were 15 to 66 samples, for the organic there were 30 samples, and for the other pollutants there were 116 to 365 samples or readings. There are significant differences between the values reported for antimony, arsenic, lead, selenium, and thallium in December 1988, and those values reported in March 1993. The December 1988 values were based on analysis by atomic adsorption (AA), while the values reported in March 1993 were based on the use of inductively coupled plasma (ICP) for the analyses. For these metals the AA process has a much lower detection level than that of the ICP process.

7.0 BUILDING 374

Process wastewaters, some laboratory wastewaters, and other wastewaters that may contain metals and/or radioactive pollutants are treated in Building 374. Table 4 contains a listing of the volumes and sources of wastewater that were routed to Building 374 in 1992, 1993, and 1994. The sources and volumes of wastewater going to Building 374 have been changing and are likely to continue to change as decontamination and decommissioning continues at RFETS. Wastewaters may be pretreated prior to going to Building 374. According to the operating procedures at RFETS, wastewaters that contain organics (e.g., solvents) are not supposed to be routed to Building 374. With the termination of production at the RFETS, it appears that none of the wastewaters are subject to EPA's effluent limitations guidelines for various industrial operations listed at 40 CFR Subchapter N. The renewal permit contains effluent limitations for conductivity, gross alpha and gross beta.

TABLE 4
BUILDING OR AREA SENDING WASTEWATER TO BUILDING 374 IN 1992-1994

	Calendar Year Flow (Gallons)		
Building or Area	1992	1993	1994
122/123 (Lab Waste) **	132,550	138,248	220,654
371*	24,378	18,664	38,696
443 (Steam Plant)	677,256	724,087	363,012
444	115,450	77,600	68,900
460	538,000	182,000	141,000
559* (Lab Waste)	3,260	904	a/
707*	100,480	104,088	30,892
774* (High Nitrate)	85,800	43,200	19,822
776*	7,350	9,383	8156
778/566 (Laundry)	4,558,857	3,643,728	1,785,601
779 **	58,279	27,990	5,865
865*	5,700	1,400	-
881*	158,400	150,000	111,412
883*	3,050	750	-
889*	350	0	-
Pond Water	2,450,365	2,729,954	310,069
Incidental Water	1,488,186	1,092,161	547,885
Interceptor Trench Water **	N/A	718,952	1,109,971
Total (Gallons)	10,407,711	9,662,749	4,761,935

a/ During 1994, the building 559 tanks were out of service. All low level waste was transferred by tanker and is included as incidental water.

* Denotes Treatable Waste Buildings. The wastes were processed through the precipitation process prior to treatment in the evaporator. All other wastes, if they met the radioactivity standards, were treated in the evaporator without pre-treatment.

** No longer sending waste water to Building 374

There are five major treatment processes in Building 374, consisting of acid neutralization, radioactive decontamination, sludge solidification, evaporation, and spray dryer and saltcrete production. Radioactive wastewater is treated, as necessary, to reduce the gross alpha level to 13,500 pCi/L or less. The radioactive decontamination process includes precipitation, flocculation, and clarification, with up to three stages available if necessary. A pressure filter may be used for additional solids separation if considered necessary. If

the water is not of acceptable quality, it is further treated until it meets the quality criteria for going to the evaporator. Sludges from the acid neutralization and the radioactive decontamination processes are routed to the sludge solidification process.

The effluent from the radioactive decontamination process and other wastewaters that are considered to be of acceptable quality are routed to a four-stage-multiple-effect evaporator. A conductivity meter in the product water line is used to provide real time monitoring of the quality of the product water from the evaporator. There is an electrically controlled three-way valve in the product water line that can be used to automatically divert the flow in the product water line to the feedwater tank for the evaporator if the conductivity exceeds a specified value. The product water from the evaporator is used as makeup water for the cooling tower systems and for boiler feedwater. Building 374 has been regulated under the Resource Conservation and Recovery Act (RCRA) by the State of Colorado, which made a determination that the product water from the evaporator was not considered a hazardous waste if it was recycled for beneficial use and the quality met the federal maximum contaminant levels (MCL) for drinking water. Conductivity of the product water has been used as the day-to-day operational control on the quality of the product water. Normally the conductivity of the product water is maintained below 150 umhos/cm. The brine solution from the evaporator is dried and/or mixed with salt concentrate and cement and solidified in triwalled fiberboard cartons.

A summary of the data in the permit application for the product water from Building 374 is given in Table 5. These data and supplemental data for 1990 and 1991 indicate that the quality of the product water is normally good to very good.

TABLE 5
SUMMARY OF APPLICATION DATA FOR BUILDING 374
PRODUCT WATER FROM EVAPORATOR

3 Samples, June, July, & August, 1993

Effluent Characteristic a/	Average	Maximum
Flow, gallons/day	23,700	86,400
pH, s.u.	6.4	7.4
Temperature, °C	41.4	42.5
Ammonia, as N, mg/L	4.57	9.06
Nitrates-Nitrites, as N, mg/L	3.3	6.3
Total Alpha, pCi/L	0.9	2
Total Beta, pCi/L	0.8	2
Aluminum, Total, mg/L	N/A	<0.033
Barium, Total, mg/L	N/A	<0.002
Cobalt, Total, mg/L	N/A	<0.008
Iron, Total, mg/L	0.131	0.141
Magnesium, Total, mg/L	N/A	<0.115
Molybdenum, Total, mg/L	N/A	<0.011
Antimony, Total, mg/L	N/A	<0.029
Arsenic, Total, mg/L	N/A	<0.001
Beryllium, Total, mg/L	N/A	<0.001
Cadmium, Total, mg/L	N/A	<0.005
Chromium, Total, mg/L	N/A	<0.008
Copper, Total, mg/L	N/A	<0.0055
Lead, Total, mg/L	N/A	<0.0016
Mercury, Total, mg/L	N/A	<0.0002
Nickel, Total, mg/L	N/A	<0.015
Selenium, Total, mg/L	N/A	<0.001
Silver, Total, mg/L	N/A	<0.006
Thallium, Total, mg/L	N/A	<0.001
Zinc, Total, mg/L	0.009	0.027
Phenols, Total, ug/L	2	3
Chloroform, ug/L	1.7	5
Dichlorobromomethane, ug/L	1	3
Phenol, ug/L	2	3
Bis(2-Ethylhexyl)Phthalate, ug/L	18	54
Fluoranthene, ug/L	0.8	5.3

a/ Those organic pollutants that were reported as "less than" on the application form are not listed in this table.

8.0 EFFLUENT LIMITATIONS

This permit includes numerical effluent limitations on the discharge from the sewage treatment plant (Outfall STP1) and internal effluent limitations on the discharge of product water from the evaporator in Building 374 (Outfall 014). In addition, there will be limitations on the quantities of certain organic compounds that may be introduced into the sewage treatment plant in contaminated non-storm waters (incidental waters).

8.1 Effluent Limitations - Outfall STP1

The numerical effluent limitations for Outfall STP1 and the basis for the limitations are listed in Table 6. There are many more effluent limitations in this permit than in the previous permit due to the revised water quality standards for segments 4 and 5 of the Big Dry Creek Basin. The new limitations include silver; gross alpha and gross beta; and several volatile organic compounds. In determining water quality based effluent limitations, no allowance was given for dilution since the discharge is normally the only flow in the receiving waters at the point of discharge. There will not be effluent limitations on ammonia at this time, based on the discussion below.

In addition to the numerical effluent limitations listed in Table 6, the permit will require that there be at least 85% removal of $CBOD_5$ (5-day carbonaceous biochemical oxygen demand) and total suspended solids, no acute toxicity in the effluent effective immediately, and within three years there shall be no chronic toxicity in the effluent from the STP. The 85% removal requirements are based on the State of Colorado's Regulations for Effluent Limitations. The requirement of not having any chronic toxicity in the effluent is based on Region VIII's NPDES Whole Effluent Toxics Control Program and is consistent with the State of Colorado's requirements. Three years are being allowed to meet the chronic toxicity requirements because the monitoring data show that there have been intermittent low levels of mortality in the acute toxicity testing and there is the potential for some chronic toxicity. However, during the first three years of the permit there is to be no acute toxicity in the effluent because the monitoring data indicate that requirement can be met.

This permit will have a limitation on $CBOD_5$ instead of BOD_5. This is because it is possible for a treatment plant to provide the required levels of treatment in terms of removal of organic material (i.e., carbonaceous BOD) in the wastewater and still have high BOD_5 concentrations due to the nitrogenous demand. This can occur when a sewage treatment plant is providing partial nitrification (i.e., oxidizing ammonia to nitrates) or is on the verge of nitrifying ammonia to nitrates. Nitrification does not elevate levels of carbonaceous BOD in the same way it affects the levels of BOD_5. Carbonaceous BOD is also a more reliable indicator of any oxygen demand effects on the receiving waters. The sewage treatment plants at Colorado Springs and Fort Collins both had this problem in the past and the permits for those two facilities now have limitations on $CBOD_5$ instead of BOD_5 The State of Colorado's regulations on effluent limitations allow for the use of $CBOD_5$ instead of BOD_5. In this permit the 30-day average limitation was changed from 10 mg/L to 8 mg/L because the $CBOD_5$ value should be somewhat less than the BOD_5 value. The 30-day average limitation of 8 mg/L and daily maximum limitation of 20 mg/L are more stringent than required by the State of Colorado's regulations.

TABLE 6
EFFLUENT LIMITATIONS FOR SEWAGE TREATMENT PLANT

Pollutant	Effluent Limitations a/	Basis
Flow, MGD	0.5/N/N	NPDES Regulations
$CBOD_5$,(Carbonaceous BOD_5), mg/L	8.0/N/20	Technology Based b/
Total Suspended Solids, mg/L	15/N/25	Technology Based c/
Fecal Coliforms, No./100 mL	200/400/N	Previous Permit
pH, su	6.5-9.0 e/	WQS d/
Oil and Grease, mg/L	N/N/10 f/	CEL g/
Nitrite as Nitrogen, mg/L	N/N/(4.5)	(Temp Mod)
Total Phosphorus, mg/L	8/N/12	Previous Permit
Chromium, Total Recoverable, ug/L	N/N/50	WQS
Chromium, Hexavalent, Dissolved, ug/L	11/N/16	
Silver, Potentially Dissolved, ug/L	0.6/N/3.8	WQS
Gross Alpha, pCi/L	11/N/N	WQS
Gross Beta, pCi/L	19/N/N	WQS
Benzene, ug/L	1.0/N/N (5)	WQS (Temp Mod)
Carbon tetrachloride, ug/L	0.25/N/N (5)	WQS (Temp Mod)
Dichloroethane, 1,2-, ug/L	0.4/N/N (5)	WQS (Temp Mod)
Dichloroethylene, 1,1-, ug/L	0.057/N/N (7)	WQS (Temp Mod)
Dichloroethylene, 1,2-, ug/L	70/N/N	WQS
Tetrachloroethylene, ug/L	0.8/N/N (5)	WQS (Temp Mod)
Trichloroethane 1,1,1, ug/L	200/N/N	WQS
Trichloroethylene, ug/L	2.7/N/N (5)	WQS (Temp Mod)

Footnotes for Table 6

a/ 30-Day Average/7-Day Average/Daily Maximum. "N" is no required limit.

b/ The effluent limitations in the previous permit were 10/N/20 for BOD_5. The limitation has been converted from BOD to CBOD to eliminate the problem of high BOD_5 values that sometimes occur when the biological treatment plant starts nitrifying ammonia.

c/ The original permit for RFETS had effluent limitations on TSS of 15/N/25. When the discharge point was changed from the STP to the outfall from Pond B-3, the limitation was changed to 30/45/N to make some allowance for algae in the pond. Now that the discharge point is back at the STP, the limitations are being changed back to the 15/N/25 as in the original permit.

d/ State of Colorado's Water Quality Standards (and Temporary Modifications). The temporary modifications for organic constituents shown in ( ) apply to segment 5 of Big Dry Creek and would therefore apply to STP1.

e/ Limitations on pH are minimum and maximum not to be exceeded at any time.

f/ The concentration of oil and grease in any single sample shall not exceed 10 mg/L nor shall there be any visible sheen in the discharge.

g/ Colorado Regulations for Effluent Limitations.

The limitations on total suspended solids (TSS) of 15 mg/L as a 30-day average and 25 mg/L as a daily maximum are the same as in the original permit and are more stringent than required by the Colorado regulations. When the discharge point was at the outfall from Pond B-3, the limitations were 30 mg/L as a 30-day average and 45 mg/L as a 45-day average. The limitations were changed to the higher values for the discharges from Pond B-3 to allow for some contribution of TSS by algae, etc. and they were the same as required by Colorado's Regulations for Effluent Limitations. In this permit the authorized discharge point is the outfall from the STP and the limitations are being changed back to the 15 and 25 mg/L limitations as in the original permit.

The limitations on total residual chlorine (TRC) was 0.5 mg/L in the previous permit based on Colorado's effluent limitations. In previous versions of this permit the limitations were set at 11 ug/L as a 30-day average and 19 ug/L as an instantaneous maximum, based on the new water quality standards for stream segments 4 and 5. These limitations have been deleted due to the changeover to UV disinfection. The TRC limits were eliminated with the understanding that there will be no further use of chlorine disinfection, and will have to be reinstated if chlorine disinfection becomes necessary in the future.

The selection of which heavy metals to include in the permit with numerical effluent limitations was based on a review of the data and the process operations, then making a judgement as to which metals there was reasonable potential to be present in concentrations exceeding the applicable water quality standards. The data from the additional monitoring of the STP plant for metals as a requirement of the FFCA provided very useful information for several of the metals. Based on the evaluation, it was decided that the permit should include water quality based numerical effluent limitations on total recoverable (TR) chromium (50 ug/L as a daily maximum), dissolved hexavalent chromium (11 ug/L as a 30-day average and 16 ug/L as a daily maximum) and potentially dissolved silver (0.6 ug/L as a 30-day average and 3.8 ug/L as a daily maximum).

Although the maximum concentration of total chromium reported in recent years has been far less than 11 ug/L, limitations on chromium are being included in the permit as a safeguard because of a past problem with chromium. The water quality standards include numerical standards for both trivalent chromium (50 ug/L as TR as daily maximum) and hexavalent chromium (11 ug/L as 30-day average and 16 ug/L as daily maximum). Hexavalent chromium is relatively unstable in environments such as sewage treatment plant effluents. If the concentration of total chromium is less than 50 ug/L in a sewage treatment plant effluent, it is unlikely that the concentration of hexavalent chromium exceeds 11 ug/L. However, the State of Colorado has expressed the concern that the

permit should have a limitation on hexavalent chromium because there are numerical water quality standards for hexavalent chromium. Although the permit will have effluent limitations on hexavalent chromium, the monitoring frequency will only be quarterly.

Water quality based effluent limitations on silver are being included in the permit as a safeguard. Although most of the photo processing wastes are now being routed to Building 374, there is still the potential for those wastes to reach the STP as the results of spills, etc. Although the monitoring data are for TR silver rather than for PD silver, the data indicate that the effluent limitations on silver can be met immediately. Experience at other sewage treatment plants has shown that the concentration of PD silver is generally significantly less than the concentration of TR silver.

Although there are water quality standards on americium, plutonium, tritium, and uranium for segments 4 and 5 of Walnut Creek, the renewal permit does not contain any effluent limitations on those radionuclides. The Department of Energy has questioned whether these radionuclides may be regulated by the Clean Water Act. The State of Colorado has indicated that it has the authority to regulate these radionuclides by virtue of its agreement with the Atomic Energy Commission (now Nuclear Regulatory Commission) and the fact that the RFETS currently is not a production or utilization facility. (See 33 Fed. Reg. 2400, January 31, 1968 and 47 Fed. Reg. 20057-20058, May 10, 1982.) Nonetheless, it was decided that these constituents could be more effectively regulated through CERCLA and RFCA (please refer to attachment 5 of RFCA, the Action Levels and Standards Framework for Surface Water, Ground Water, and Soils), because it was agreed that those vehicles have clear jurisdiction, include the same numeric effluent limitations that would have been used in the permit, and can be applied without incurring the delay and expense in potential litigation.[1]

Signing of the RFCA has provided a regulatory mechanism for applying the stream standards at the terminal pond discharges, by agreement, with enforceable mechanisms to ensure compliance under the CERCLA authority. This mechanism will effectively control releases of americium, plutonium, uranium and tritium from the site. It is EPA's belief that imposition of effluent limitations for americium, plutonium, tritium, and uranium at STP1 discharge under NPDES would not significantly enhance regulatory control of these constituents.

No NPDES monitoring requirements are being imposed for these constituents. Monitoring for americium, plutonium, tritium, and uranium shall be conducted, reported, and the results evaluated and enforced in accordance with the Action Level and Standards Framework (ALF) for surface water, and other applicable provisions of RFCA.

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[1]The permit contains numerical effluent limits on gross alpha and gross beta, based on the water quality standards for segments 4 and 5 of Walnut Creek. The limitations are 30-day averages. According to Permit Compliance System (PCS) data, Colorado and other states that have been authorized to administer the EPA's NPDES program have issued permits with limits on gross alpha and/or gross beta and/or radioactivity. To the extent that any exceedance of a gross alpha or gross beta effluent limit in the permit is due to elevated levels of americium, plutonium, tritium, or uranium, EPA anticipates that it will be regulated under the terms of the RFCA. The gross alpha and gross beta effluent limitations in this permit are intended primarily to deal with radiation from sources other than americium, plutonium, tritium, or uranium.

This approach holds the STP discharge for radionuclides to the same level of performance established for other potential sources. This is consistent with RFCA and adequately protective of the receiving stream and downstream users.

The June 12, 1995, revision of the water quality standards for the Big Dry Creek Basin resulted in the ammonia standards being removed from segments 5 and 4b. The first point downstream of the STP where there is a water quality standard for ammonia is Walnut Creek at Indiana Street.

There are conflicting data from different sources as to whether or not the water quality standards on ammonia are being consistently met in Walnut Creek at Indiana Street. The existing data do not appear adequate to reliably determine what effluent limitations, if any, on ammonia are necessary to ensure these standards are met. Major factors affecting the concentrations of un-ionized ammonia in Walnut Creek at Indiana Street are pond operations, weather conditions, and loading on the STP. How the ponds are operated can influence the detention time in the ponds. If it were ever decided to convert the pond system to a "flow through" system, this would greatly reduce detention time and radically alter the behavior of ammonia in the system. In general, winter appears to be the most critical season for ammonia levels, which are temperature-related. However, reduced loadings on the STP may result in lower effluent concentrations of ammonia and alleviate problems in the stream, even during cold periods. With all of these uncertainties, it was decided not to include limitations on ammonia in the permit now, but instead require the permittees to work with the downstream users and other entities who are currently beginning a basin-wide ammonia study. This approach will ultimately provide better information that can be used in determining whether or not effluent limitations on ammonia from RFETS are necessary, and if so, what those limitations should be. If it is found that ammonia limitations are necessary, the permit may be reopened to include the appropriate limitations and a compliance schedule, if needed.

The permit contains effluent limitations on several volatile organic compounds. The determination as to which organic chemicals to include in the permit was based on a judgement of which had a reasonable potential for being in the effluent at concentrations exceeding the appropriate water quality standards. The chemical could be present due to current usage at RFETS, be found in the contaminated ground water at the plant site, and/or result from the wastewater treatment process. An extensive review of data on contaminant occurrence and in-stream water quality was performed as part of the process for establishing the temporary modifications of stream standards in Big Dry Creek Segment 5. The need for a temporary modification is indicative of potential problems with meeting the underlying standard. Therefore, specific limitations are included for all constituents with temporary modifications. Chloroform limits, which were included in previous versions of this revision, were dropped due to the change to a UV disinfections system, which will eliminate the need for controlling an artifact of chlorination.

The permit has an effluent limitation on flow of 0.5 MGD as a 30-day average, which is the current design flow of the STP. Some information indicates there may be a trend toward increasing inflows to the STP due to increased infiltration and inflow into the collection system, much of which may be subject to deterioration due to its age. The NPDES regulations (40 CFR 122.45(f)(1)) specify that all pollutants limited in permits shall have limitations, standards, or prohibitions expressed in mass with certain

8.2 Effluent Limitations - Outfall 014

For purposes of this permit, the product water from the evaporator in Building 374 is considered as an internal waste stream and the permit will include effluent limitations for that water. Effluent limitations on the evaporator product water are considered necessary and appropriate because Building 374 may receive wastewaters that have significant concentrations of heavy metals and/or radionuclides. The intent of the effluent limitations is to require that the wastewaters are treated to the maximum extent practical with the existing facilities. The combination of pretreatment, as appropriate, and the use of the multiple-effect evaporator is capable of producing a relatively high quality water.

In the process of developing effluent limitations for Outfall 014, consideration was given to having numerical effluent limitations on a number of heavy metals, volatile organic compounds, some radionuclides, and conductivity. However, it was ultimately decided that the better approach would be to have numerical effluent limitations only on conductivity, gross alpha, and gross beta, plus having some operational requirements.

The numerical effluent limitations for Outfall 014 are given in Table 7.

TABLE 7
EFFLUENT LIMITATIONS FOR OUTFALL 014

Effluent Characteristic	30-Day Average	7-Day Average	Daily Maximum
Conductivity, umhos/cm at 25°C	75 m/	N/A	150 m/
Gross Alpha, pCi/L	11.0	N/A	N/A
Gross Beta, pCi/L	19.0	N/A	N/A

M/ The numerical effluent limitations on conductivity become effective six (6) months after the effective date of this permit.

Several considerations went into the decision of not having numerical effluent limitations on the heavy metals, organics, and radionuclides. Data from normal treatment technologies for metals (e.g., chemical precipitation, etc.) should not be used to determine the effluent limitations for heavy metals in this situation since the concentrations of heavy metals in the product water normally is significantly less than that obtained by the normal treatment technologies. There are insufficient data to determine statistically reliable limitations. The use of conductivity as an effluent limitation would indirectly limit the discharge of heavy metals.

Building 374 is not equipped to treat wastewater for the removal of organics. The discharge of organics to Building 374 has been minimized by having the operators at the individual sources of the wastewater not discharge wastewaters contaminated by organics to Building 374. Based on the results of the periodic monitoring of the product water, this practice appears to be relatively successful. There does not appear to be a need for numerical effluent limitations and there would be the problem of determining what those limitations should be. The permit will require the permittee to continue the practice of minimizing, to the extent practical, the routing to Building 374 those wastewaters that are

contaminated with organics (e.g., solvents, oils, etc.). The effluent limitations on conductivity will indirectly control organics in that excessive concentrations of organics in the wastewater going into the evaporators can cause operational problems.

There will not be effluent limitations on specific radionuclides for the discharge from Outfall 014. There is no adequate basis for determining technology based effluent limitations. There are sufficient data on gross alpha and gross beta to establish effluent limitations on these constituents based on a combination of the apparent capabilities of the existing system and reasonable analytical requirements.

The permit will require that effective immediately the evaporator be operated in accordance with the current operating procedures and with the objective of keeping the conductivity of the discharge less than 150 umhos/cm at 25°C. (Note: The reference to 25°C does not mean that the conductivity reading must be taken at 25°C, but that the actual reading must be corrected as if the reading was taken at 25°C.) No later than six (6) months after the effective date of the permit the numerical effluent limitations on conductivity must be met. The daily maximum limitation of 150 umhos/cm at 25°C is the same as the current operating criteria and seems to represent the present capability with the variety of wastewaters processed through the evaporator. The permit also requires that the 30-day average conductivity not exceed 75 umhos/cm at 25°C. There is a provision that the conductivity may exceed 150 umhos at 25°C up to 7 hours and 26 minutes in any calendar month, but no individual excursion above 150 umhos/cm at 25°C shall exceed five (5) minutes in duration. This is similar to the provision in the NPDES regulations (40 CFR 401.17) that allows for an exceedance of the pH limitation where pH is monitored continuously. The 7 hours and 26 minutes represents 1% of a 31 day month. While the regulations for continuous pH monitoring allow for an individual exceedance up to 60 minutes, the permit will require that the conductivity not exceed 150 umhos at 25°C for more than 5 minutes in any individual excursion. The reason for limiting the individual excursions to a maximum duration of 5 minutes is because the discharge can be routed back to the feedwater tank for the evaporator while it may take much longer to control the pH of wastewater in a flow-through treatment system. The provision for individual exceedances up to 5 minute duration is being included in the permit to allow for short-term upsets that may occur during startups, etc. The permit also requires that there be no discharge while the conductivity meter is not operating. This may require having a spare conductivity meter readily available.

The permit specifies that the discharge shall consist only of product water from the evaporator(s) in Building 374. The discharge shall be routed only to the cooling-tower makeup water system, the boiler-feedwater system, and/or the sanitary-sewer system unless prior approval is granted by the permit issuing authority. The sanitary sewer system was added as an option in case the supply of product water exceeds the demand.

9.0 SELF-MONITORING REQUIREMENTS - OUTFALLS STP and 014

The self-monitoring requirements for the discharge from STP1 are given in Table 8. The frequency of monitoring for the more conventional pollutants (e.g., TSS) is based on past requirements and the State of Colorado's guidance for monitoring requirements in permits. The determination of the frequency of monitoring for the other pollutants was based on judgement, taking into consideration such things as the potential for the limitation to be exceeded, the likely sources and means of entry into the system, the environmental effects of the pollutant, and the cost of the analysis.

STP effluent monitoring for organic constituents is required once monthly, with one additional sample to be taken during periods, if and when, contaminated non-storm waters are being discharged to the STP. It is believed that these non-routine flows are the most likely source of organic loading to the STP and should be specifically targeted for monitoring to ensure that the system is capable of adequately treating these contaminants. If the system cannot provide proper treatment, allowable loadings and the associated procedures for incidental waters disposal under the industrial area IM/IRA and associated field operating procedures will have to be reevaluated.

Monitoring for plutonium and americium presents a dilemma in that there is a very low probability that the effluent limitations would be exceeded and the analyses are very expensive and require several weeks to complete at the required sensitivity levels, yet there is a great deal of environmental concern about these constituents. The requirement for a feasibility study on improved radionuclide analytical techniques (See Section 10.0) is an attempt to start the process of resolving this difficulty.

The self-monitoring requirements for Outfall 014 are listed in Table 9. The purpose of the monthly monitoring for the heavy metals and the purgeable halocarbons is to have a periodic check on the overall quality of the product water from the evaporator.

In order to have quality assurance on the readings of the conductivity meter, the permit requires that a quality control chart be developed for the conductivity meter in the discharge line, using a minimum of 20 determinations with a standard solution that has a known conductivity in the range of 140 to 160 umhos/cm at 25°C. The quality control chart shall be updated at least annually. At least once per week, the probe for the conductivity meter shall be removed from the discharge line and a reading taken of a standard solution that has a known conductivity in the range of 140 to 160 umhos/cm at 25°C. If the reading is more than 2.0 standard deviations (based on the quality control chart) from the known standard, there shall be no discharge until the conductivity meter is recalibrated.

TABLE 8
SELF-MONITORING REQUIREMENTS - SEWAGE TREATMENT PLANT

Effluent Characteristic	Frequency	Sample Type
Total Flow, MGD	Continuously	Recorder
$CBOD_5$, mg/L	2/Week	Composite
Total Suspended Solids, mg/L	2/Week	Composite
Fecal Coliforms, No./100 mL	2/Week	Grab
Nitrate as Nitrogen, mg/L	2/Week	Composite
Nitrite as Nitrogen, mg/L	2/week	Composite
Ammonia, as Nitrogen, mg/L	2/Week	Composite
Total Phosphorus, mg/L	2/Week	Composite
Oil and Grease, Visual	Daily	Observation
Oil and Grease, mg/L	a/	Grab
pH, s.u.	Daily	Grab
Alkalinity as $CaCO_3$, mg/L	2/week	Composite
Chromium, TR, ug/L	2/Month	Composite
Chromium, Hexavalent, Dissolved, ug/L	b/	Grab
Silver, PD, ug/L	Weekly	Composite
Gross Alpha, pCi/L	2/Month	Composite
Gross Beta, pCi/L	2/Month	Composite
Benzene, ug/L	1/Month	Grab
Carbon tetrachloride, ug/L	1/Month	Grab
Dichloroethane, 1,2-, ug/L	1/Month	Grab
Dichloroethylene, 1,1-, ug/L	1/Month	Grab
Dichloroethylene, 1,2-, ug/L	1/Month	Grab
Tetrachloroethylene, ug/L	1/Month	Grab
Trichloroethane, 1,1,1-, ug/L	1/Month	Grab
Trichloroethylene, ug/L	1/Month	Grab
Whole Effluent Toxicity (WET)	Quarterly	Composite

TABLE 9
SELF-MONITORING REQUIREMENTS FOR OUTFALL 014

Effluent Characteristic	Frequency	Sample Type
Total Flow, gpd	Continuously	Recorder
Conductivity, umhos/cm at 25°C	Continuously	Recorder
Gross Alpha, pCi/L	Twice monthly	Composite
Gross Beta, pCi/L	Twice monthly	Composite
Heavy metals listed in Table III of Appendix D of 40 CFR 122 a/	Monthly	Composite
Purgeable halocarbons listed in Method 601, Appendix A of 40 CFR 136	Monthly	Grab

a/ If a visible sheen is observed, a grab sample shall be promptly collected and analyzed for oil and grease.

b/ Quarterly samples required for one year following any TR readings >11ug/L

10.0 SPECIAL CONDITIONS OTHER THAN STORM WATER

In addition to the effluent limitations and the effluent monitoring requirements for the STP and the product water from the evaporator in Building 374 (Outfall 014), the permit contains other requirements that directly or indirectly involve the STP. These requirements are discussed below. Requirements for storm water are discussed in Section 11.

10.1 Influent Monitoring and Inspection for Spill Containment and Operational Control

The permit includes requirements (Part I.C.9.) that the permittees monitor the influent to the STP for conditions that could indicate that there has been a spill or a discharge to the sanitary sewer system that could cause operational problems at the STP and/or result in the discharge of excessive amounts of pollutants. At a minimum, the influent to the sewage treatment plant shall be monitored for the following:

Conductivity, umhos/cm at 25°C;

pH, s.u.;

Lower explosive level (LEL) of the atmosphere above the flow equalization basin;

Visual observation of either the online-flow equalization basin and/or the flow at the headworks of the sewage treatment plant for unusual conditions such as color, excessive foam, odors, oil sheen, etc.; and

Oxygen uptake rate of a grab sample taken at the headworks of the sewage treatment plant.

For the most part, this monitoring is already being done as the result of activities done under the FFCA. The RFETS had been using an online respirometer to give an indication of significant changes in organic loading or the presence of toxic materials that could affect the biological treatment system. However, there were problems with equipment plugging and the process not working consistently. The online unit has been replaced with a respirometer that can run one sample at a time. Running an uptake rate on a grab sample from the online-flow equalization basin in Building 990 or a grab sample taken at the headworks of the STP each operating shift should provide adequate information and will not be subject to the plugging problems. Monitoring for pH, conductivity, and lower explosive level normally are done continuously. The permit requires continuous monitoring to the maximum extent practical, but there are allowances for when continuous readings cannot be taken. The permit requires that a record be kept of all monitoring results and any corrective actions taken as the result of the monitoring shall be noted.

It should be noted that the permit provides the flexibility of taking samples for the influent monitoring at either the flow equalization basin in Building 990 or at the headworks of the STP. Although Building 990 is in close proximity to the STP, Building 990 is located within the protected area (PA). Because of security measures, access into the PA is somewhat time consuming. The permit provides for some flexibility in the influent monitoring to deal with this situation.

The permit requires that within six (6) months after the effective date of the permit, the permittees are required to develop and implement a plan on how to respond to abnormal readings and/or observations. The plan should be modified as operating experiences and changes in conditions indicate appropriate. The plan does not have to be submitted for approval, but must be made available for inspection upon request.

The permit also requires that within twelve (12) months of the effective date, the permittee complete a feasibility study to identify and evaluate potential methods for improving the speed and accuracy of analytical results for radionuclides. Availability of methods capable of giving accurate results at concentrations equal to stream standards in a short time frame would greatly enhance RFETS ability to identify and respond to spills or off-normal events in addition to offering vast improvements in the evaluation of STP performance and other water management techniques on the site.

10.2 Sewage Sludge Requirements:

Part I.C.10. of the permit has requirements for the disposal of the sludge from the STP. Unless otherwise approved by the NPDES sludge permitting authority, the sludge from the sewage treatment plant shall be disposed of as a low-level radioactive waste in accordance with the applicable requirements of the Department of Energy. If at such time the sludge from the sewage treatment plant is no longer classified as a low-level radioactive waste and the permittees want to dispose of the sludge in some other manner, the permittees shall submit to the NPDES sludge permitting authority a written request for authorization to dispose of the sludge by another method. The request shall describe the proposed method of disposal and shall be submitted at least 180 days prior to the planned date of implementation. The method of disposal would have to comply with requirements of both EPA and the State of Colorado.

The permit has some annual reporting requirements on the amount of sludge produced during the year, the amount of sludge placed into temporary storage, and related items. Although the permit does not require analysis of the sludge, the permittees are required to report a summary of the analytical data for all analyses of the sludge for the pollutants listed in Table 1 of 40 CFR 503.13.

10.3 Chromic Acid Incident Plan

As part of the FFCA, the RFETS developed the Chromic Acid Incident Plan (CAIP), which addressed measures to prevent or minimize the potential for spills occurring and to prevent or minimize the potential for spills reaching the STP. The CAIP included the Tank Management Plan and the Drain Identification Study. The final items required under this plan have been closed out. DOE will use this information developed in its planning for decontamination and decommissioning (D&D) of the buildings. CDPHE and EPA will regulate D&D of the buildings under the terms of the RFCA.

10.4 Employee Awareness, Training, and Spill Control Programs

Part I.C.11. of the permit requires within six months of the effective date, the permittee demonstrate the existence of an adequate employee awareness, training, and spill control program. Most, if not all, of this has been previously done at RFETS, but it will be a requirement of the permit so that it will be ongoing. Employee awareness and training is a very important aspect of spill prevention and control and needs to be an ongoing program at RFETS, especially with all the changes that are occurring.

10.5 Storage Tanks for Spills and Unacceptable Quality Water

In 1996 the Site completed the installation of a series of tanks for collecting and storing "contaminated" wastewater that is unacceptable for treatment or not of acceptable quality for discharge. In addition, Part 1.C.12. requires that within 6 months of the effective date of the permit a contingency plan for treating and disposing of the water that has been routed to the storage facility is required. Upon approval, the plan shall be implemented within six months. The basic intent of these requirements is to have an environmentally acceptable alternative to putting contaminated water in Ponds A-1, A-2, B-1, and B-2. These ponds may still have a useful role in providing spill containment, but there needs to be a better alternative for handling contaminated water that can be controlled and routed elsewhere.

10.6 Non-Storm Water Discharges That Discharge to The Storm Water Drainage System

The application (Form 2F) that was submitted October 1, 1992, for the storm water discharges at the RFETS identified approximately 74 non-storm water discharges to the storm water drainage system. Because of the complexity of the RFETS, the study to identify non-storm water discharges to the storm water drainage system is ongoing. A summary of the information on the identified non-storm water discharges is given in Table 10. Most of the discharges consist of ground water pumped intermittently from utility pits, collection sumps for foundation drains and steam pits, or excavations for other construction or cleanup purposes. These waters are called "incidental waters" in other RFETS documents, such as the Industrial Area IM/IRA and the Incidental Waters Plan,

and are also included in what the site terms "non-routine discharge streams" in the inventory of STP inflows. Since the ground water in some parts of the RFETS site is contaminated and various other sources of contamination exist within and around the industrial areas, these incidental waters or non-routine discharges are potentially contaminated with organic, inorganic and radionuclide constituents.

The permit sets up two main options for dealing with these wastewaters, depending on whether they are determined to be contaminated or uncontaminated. For purposes of this permit "uncontaminated water" is defined as water which meets the applicable water quality standards of Segment 5 of the Big Dry Creek Basin. This definition is established to ensure that water quality standards within the upper portion of the drainage basins can be maintained even when non-storm waters are discharged to surface drainage channels during periods when little or no flow exists in the receiving stream. The permit provides some guidelines for how this determination should be made, but does not prescribe a specific procedure. The intent of this approach is to allow the permittee a certain degree of flexibility in making this determination, in order to allow the most efficient and effective method to be used for each of the wide variety of situations in which incidental wastewaters may be encountered. The permitting agency will periodically review the site's performance in making these determinations, and require adjustments as appropriate.

The permit provides that uncontaminated water from these non-storm water discharges at RFETS may be discharged to the various storm drainage systems. If additional such discharges are discovered in the continued investigation for non-storm water discharges, uncontaminated water may be discharged to surface drainage channels under the provisions of this permit provided the storm water application is updated to include those discharges. (Note: Since this water does not contain pollutants or contaminants, no effluent limits have been established under this permit. However, the discharge of "uncontaminated water" may be regulated under RCRA and CERCLA if such water contains hazardous wastes, hazardous constituents, hazardous substances, or pollutants or contaminants; in fact, this permit can be modified later if such waters are found to contain hazardous wastes, hazardous constituents, hazardous substances, pollutants, or other contaminants.)

If water from a non-storm water discharge is found to be contaminated, the permit requires that the decision on the disposition of that water be made in accordance with the decision process set forth in the Industrial Area IM/IRA. If that evaluation shows that the disposition of that water should be through the CERCLA Consolidated Treatment Plant (Building 891), then the water will be routed there. A record is required to be kept of all decisions, to include the factors considered in making the decision and the basis for the decision. If the decision is not to treat the water in a CERCLA treatment unit, the water may be treated at the STP provided that certain conditions are met. The intent of these conditions is to provide a safeguard against overloading the STP and to require that adequate pretreatment be provided, as appropriate.

Before contaminated water from any of the non-storm water discharges can be discharged to the STP, the concentration of total toxic organics (TTO) must be less than 2.1 mg/L. For purposes of this permit "TTO" is the summation of all quantifiable values greater than 0.01 mg/L for the organic compounds listed in Table II of Appendix D of 40 CFR 122. The 2.1 mg/L value is the same as the effluent limitation and pretreatment requirements in

the effluent limitations guidelines for the Metal Finishing Point Source Category (40 CFR 433). This requirement is included as a general check to limit organic loading to the STP. It is anticipated that this measurement can be made by a field or onsite method, to help avoid excessive analytical costs.

In addition, the permit includes both a limit on the volume of contaminated non-storm waters that may be discharged to the STP in a given 24-hour period, and specific loading limits for those organics believed to be most likely to be found in these waters. These two stipulations are designed to prevent slug loadings to the STP and ensure that introduction of these wastewaters does not result in problems with meeting effluent limitations for these organic constituents.

Total volume of water from these non-storm water discharges that is discharged to the STP in any one day cannot exceed 10,000 gallons per day and the quantities of certain organic compounds cannot exceed the amounts shown in Table 5 of the permit. The determination of which organics to limit was based on an evaluation of which organics are used at RFETS and/or are likely to be present in contaminated water from the non-storm water discharges and have reasonable potential of being present in the effluent from the STP in concentrations near or greater than the applicable water quality standard. EPA's RREL Treatability Data Base has data on percent removals of various pollutants by different treatment systems. Using the applicable water quality standards, an average flow of 115,000 gpd, and typical percent removals in activated sludge (AS) systems, the allowable amount of each organic compound that could be treated in the STP was calculated. The values used in the calculations and the equations are shown in Table 11 and its footnotes.

The permit requires monitoring of contaminated non-storm water discharges to the STP at the minimum rate of one sample for each 25,000 gallons (I.C.13.d). It is anticipated that there will be many instances where small quantities of incidental water may be collected over a period of several days or weeks, such as from an open construction excavation. The intent of this monitoring requirement is to allow these small quantities of water to be consolidated and sampled as a composite to confirm the levels of contamination present before discharge. This compositing should help prevent excessive analysis cost and facilitate more even loading of the STP.

TABLE 10
SUMMARY OF NON-STORM WATER DISCHARGES TO STORM WATER DRAINAGE SYSTEM
AT ROCKY FLATS ENVIRONMENTAL TEST SITE

Description	Number	Probable Water Source
Foundation Drain	15	Ground water
Possible Foundation Drain	1	Probably ground water
Electric Vault	1	Ground water
Fuel Tank Sump	1	Information not available a/
Metal Culvert	1	Apparently steam Condensate b/
Steam Condensate Drain Hose	1	Steam Condensate
Steam Pit	10	Ground water
Drains for Steam Condensate Line	3	Steam Condensate
Security Vault	1	Ground water
Utility Pit	37	Ground water
Water Meter Pit	3	Ground water
Total Number	74	

a/ There may not actually be a discharge from this source.
b/ Part or all of the discharge may be steam condensate.

TABLE 11
INFLUENT VALUES THAT CAN BE TREATED BY STP
VOLATILE ORGANICS OF CONCERN

Organic Compound	WQS ug/L a/	% Removal b/	Allowable Effluent Mass (grams/day)	Allowable Influent Mass (grams/day)
Benzene	5	92	2.18	27.2
Carbon Tetrachloride	5	90	2.18	21.8
Chloroform	100	80	43.53	217.6
Dichloroethane,1,2	5	60	2.18	5.4
Dichloroethylene,1,1	7	95	3.05	60.9
Methylene Chloride	5.7	60	2.48	6.2
Tetrachloroethylene	5	85	2.18	14.5
Trichloroethylene	5	93	2.18	31.1

Footnotes:

a/ WQS = State of Colorado Water Quality Standards.

b/ Values taken from EPA's RREL Treatability Data Base, approximate removal percentage when influent values were between 0-100 ug/liter. Percent removals tend to increase with increasing influent concentrations.

Calculations used:

$E = WQS(ug/L)*115{,}000(gpd)*3.785(liters/gallon)*10^{-6}(grams/ug)$

$$I = \frac{E}{(1 - \% \text{ Removal}/100)}$$

Where:

E is the allowable amount of organic chemical that may leave in the STP effluent; units are grams per day.

I is the total mass of the organic chemical that can be added to STP; units are grams per day.

10.7 Ammonia Study Requirements

Part I.C.14. of the permit requires the permittees to participate in the ongoing basin-wide ammonia studies. It is thought that an independent ammonia study for the stream segments on the site would not be productive at this time. A basin-wide evaluation of ammonia problems and the dynamics of the flow systems downstream will offer a sound basis for deciding what, if any specific limitations may need to be imposed in segments 4 and 5 in the future.

11.0 STORM WATER REQUIREMENTS

The RFETS is already implementing various best management practices (BMP) that help to minimize the amount of pollutants present in the storm water runoff from the RFETS plant site. Based on the water quality data for the terminal ponds (A-4, B-5, and C-2) collected as part of the Agreement in Principal between the State of Colorado and DOE, it appears that for the most part these BMPs are doing a relatively good job. A possible exception is the periodic occasion when plutonium concentrations in Pond C-2 exceeded the water quality standard of 0.05 pCi/L (now changed to 0.15 pCi/L). It is not known if the plutonium is coming from the plant site and/or the sediments located in the drainage system leading to Pond C-2. The origins of this material are still under investigation. It is not possible to determine from that data if the storm water discharges from the plant site were causing a violation of any water quality standards in the receiving waters. The concentrations of all organics were below detection levels (i.e., 20 ug/L for most compounds and 100 ug/L for a few compounds) of the analytical methods used. The water quality standards for many of the metals are for the dissolved metal while the analyses for the metals was done as either the total or total recoverable metal, as required by the application. Also, many of the samples were collected near the bottom of drainage channels, where the bottom sediments tend to be resuspended during higher flows. The permit application form (Form 2F) did not require any radiological data and none were submitted. The event-related and routine monitoring programs instituted within the last two years are expected to provide a better basis for evaluating the efficacy of attempts to limit contaminant loadings to the creeks. Additional control measures will be identified and required as necessary, either through the permit or through RFCA.

The permit requires that the permittees continue to implement existing BMPs until the BMPs are modified or replaced by the storm water pollution prevention plan (SWPPP) that the permit requires to be developed and implemented. The requirements for development and implementation of the SWPPP are basically the same as in the EPA general permit for storm water discharges associated with industrial activity that was published in the Federal Register on September 9, 1992. The general basis for that SWPPP is given in the Federal Register and will not be repeated here.

One notable change in the storm water requirements in this permit from the requirements in the September 9, 1992 general permit involves the time limitations for activities that occurred prior to issuance of the permit. In the September 9, 1992, general permit there is a time limitation of three (3) years prior to the effective date of that permit for listing of exposed materials and listing significant spills and leaks. The renewal permit for the RFETS takes that approach except for radioactive materials. There is no time limitation on past activities involving radioactive materials that may result in exposure to storm

water. This change was made because there were significant releases of radioactive materials more than three years ago. Some of the radioactive materials of concern (e.g., plutonium) are very persistent in the environment, and even small quantities are of significant environmental concern.

The SWPPP is to be developed within six months of the effective date of the permit and implemented within six months after that. Additional time may be allowed for implementation upon showing of good cause. Although many BMPs are already being implemented, the RFETS is a complex facility and it will take time to pull everything together into one plan. Copies of the plan are to be sent to EPA and the State.

It is very important to note that development and implementation of the SWPPP required by this permit does not relieve the permittees of the responsibilities to develop and implement specific BMPs as required for remedial actions under CERCLA and/or RCRA. As appropriate, those BMPs may be incorporated into the SWPPP by reference.

In order to obtain an indication of the effectiveness of the SWPPP, Part I.C.16. of the permit requires monitoring needs required to support the SWPPP be incorporated into the integrated monitoring plan established pursuant to RFCA during the annual update process. This will ensure that the storm water monitoring program effectively serves all site needs and that sampling and analysis costs are not duplicated.

12.0 CO-PERMITTEES

DOE, K-H, and RFCSS are all co-permittees for this permit. EPA recognizes that each of the co-permittees have different primary responsibilities in the operation of RFETS. However, EPA also recognizes that there often is not a clear and exact separation of responsibilities, but rather the responsibilities often are interrelated. Therefore, EPA considers that all three of the permittees are each jointly and severally liable for compliance with all terms and conditions of this permit. EPA may take enforcement actions as appropriate against DOE, K-H, and/or RFCSS.

13.0 MISCELLANEOUS

The permit expiration date will be at the end of the last full calendar quarter that ends just prior to the date five years from the effective date of the permit. The permit will be issued for as close to five years as possible, but not exceeding five years from the effective date and with the permit expiration date being at the end of a calendar quarter.

APPENDIXES

APPENDIX 1
INTERNAL WASTE STREAMS TO SEWAGE TREATMENT PLANT

BUILDING NO.	WASTE DESCRIPTION (Routine Discharges)	QUANTITY GENERATED (gal/yr.)
111 a/	3 Developer process lines	1,000
	Process water	60
	Desilvered fixer-effluent	432
	Developers with additive	55
122	Developer and water	120
125	Ultrasonic cleaning waste	2
130	DI water bath	12,000
331	Contaminated water and detergents	1,000
	Hose wash water	10,000
	Truck wash water	10,000
	Floor wash water	10,000
333	Latex cleaning rinse	120
335	Fire extinguisher recharge wastewater	5
371	Cooling tower blowdown	45,000
440	Soaps and detergents	2,000
443	Boiler blowdown	310,000
454	Cooling tower blowdown	24,000
457	Cooling tower blowdown	2,000
460 b/	Cooling sump water	3,000
	Oakite c/	2,250,000
	Rinsate with Oakite	2,250,000
	Mariko detergent	60
	Water from latex cleanup	60,000
549	Used Go Jo (washwater)	50
560	Cooling tower blowdown	107,000
563	Cooling tower blowdown	107,000
662	Water with dirt, oil, grease and spent Salco cleaning agent	150

a/ Photoprocessing wastes from Building 111 are now routed to precious metal recovery unit.
b/ Sheet metal operations in Building 460 are being discontinued.
c/ Oakite is trisodium phosphate

Continued on next page

APPENDIX 2

RESULTS OF MONITORING FOR METALS AT THE SEWAGE TREATMENT PLANT DURING 1994

Total Recoverable Metals a/, Units ug/L

Month	Sb	As	Be	Cd	Cu	Fe	Pb	Mn	Hg a/	Ni	Ag	Zn
January b/	<24	1.1	<1.0	0.61	4.3	45.2	1.2	16.9	<0.2	<17	<0.2	38.2
January b/	<24	<1.0	<1.0	<0.2	<2.0	66.4	<1.0	23.3	<0.2	<19	<0.2	21.6
February b/	<24	<1.0	<1.0	0.3	4.2	70.2	<1.0	17.8	<0.2	<19	1.3	35.6
February b/	<24	2.7	<1.0	0.3	6.1	143	<1.0	22.0	<0.2	<19	0.2	70.8
March b/	<28	1.03	<1.0	0.2	5.0	118	<1.0	29.8	<0.2	<10	0.3	26.1
March b/	<28	1.4	<1.0	0.4	10.0	78.0	<1.0	27.0	<0.2	<10	0.2	15.0
April	<28	<1.2	<1.0	<0.1	3.0	42.4	1.9	15.8	<0.2	<10	0.3	25.4
May	<26	6.2	<1.0	0.1	<3.0	66.5	<1.0	32.6	<0.2	<15	0.7	19.2
June	<26	9.3	<1.0	<0.1	<3.0	184	<1.0	41.2	<0.1	<15	<0.3	14.0
July	<26	7.8	<1.0	<0.1	3.5	56.2	<1.0	22.3	<0.1	<15	<0.2	26.7
August	<26	8.8	<1.0	<0.1	4.9	131	<1.0	34.8	<0.2	<15	<0.2	23.4
Septembe r	<27	3.8	<1.0	0.09	<3.0	60.8	<0.3	28.3	<0.2	< 9	0.84	20.9
October	<27	<1.0	<1.0	<0.2	3.4	81.1	2.0	34.1	<0.2	14.3	<1.0	33.6
November	<27	1.0	<1.0	<0.1	6.0	104	0.4	30.5	<0.1	< 9	0.2	35.6
December	<26	<1.0	<1.0	<0.1	<3.0	172	<1.0	28.2	<0.1	<13	<0.2	24.3
Maximum Value c/	c/	9.3	c/	0.61	10	184	2.0	41.2	c/	14.3	1.3	70.8

a/ Mercury is total mercury.

b/ Two samples were collected during these months.

c/ Less than values were not considered in determining maximum values.

Whole Effluent Toxicity Monitoring Data for STP for 1996-1999

Sample Date	Species a/	Max. No. Dead, %	% effluent with Max. Dead	Init. NH3 Conc. Mg/L	pH Final	Comments
4/9/96	cdaph	0	100	18.5	8.3	
4/9/96	Fathd	10	100	18.5	8.2	
4/8/96	cdaph	0	100	1.0	8.0	
4/8/96	Fathd	0	100	1.0	7.9	
6/3/96	cdaph	0	100	1.04	8.2	
6/3/96	Fathd	0	100	1.04	8.0	
4/28/96	cdaph	0	100	4.92	8.3	
4/28/96	Fathd	5	100	4.92	8.0	
7/9/96	cdaph	0	100	23.2	7.9	
7/9/96	Fathd	0	100	23.2	7.9	
7/22/96	cdaph	0	100	2.24	8.4	
7/22/96	Fathd	55	100	2.24	8.7	**Fail**
10/1/96	cdaph	0	100	1.0	8.1	
10/1/96	Fathd	5	50	1.0	7.8	
10/8/96	Fathd	5	50	20.2	8.0	
10/8/96	cdaph	0	100	20.2	8.2	
12/20/96	cdaph	0	100	6.37	8.1	
12/20/96	Fathd	5	50	6.37	7.8	
1/14/97	cdaph	0	100	28.6	8.0	
1/14/97	Fathd	15	100	28.6	7.9	

Sample Date	Species a/	Max. No. Dead, %	% effluent with Max. Dead	Init. NH3 Conc. Mg/L	pH Final	Comments
12/14/97	cdaph	0	100	1.0	8.1	
12/14/97	Fathd	0	100	1.0	8.2	
1/19/98	Fathd	0	100	1.0	7.8	
1/19/98	cdaph	5	75	1.2	8.1	
2/10/98	Fathd	0	100	24.3	8.3	
2/10/98	cdaph	10	25	24.3	8.2	
2/12/98	Fathd	0	100	5.11	7.6	
2/12/98	cdaph	5	25	5.11	7.2	
4/2/98	cdaph	15	50	3.17	8.3	
4/2/98	Fathd	0	100	3.17	7.6	
4/6/98	cdaph	5	75	4.53	8.1	
4/6/98	Fathd	5	100	4.53	8.1	
4/16/98	cdaph	45	100	12.8	8.2	
4/16/98	Fathd	45	100	12.8	8.0	**Fail:** 85%dead after 98hrs
5/21/98	cdaph	0	100	1.0	8.1	
5/21/98	Fathd	0	100	1.0	7.9	
8/24/98	Fathd	0	100	4.86	7.9	
8/24/98	cdaph	5	100	4.86	8.1	
8/27/98	Fathd	10	100	1.0	9.0	
8/27/98	cdaph	5	75	1.0	8.6	
8/27/98	Fathd	15	25	1.0	7.3	
8/27/98	cdaph	5	100	1.0	7.9	

APPENDIX 4
DATA FROM FORM 2C FOR SEWAGE TREATMENT PLANT

	12/27/88 Apl. a/		3/15/93 Apl. b/	
Pollutant	Daily Max.	Long Term Avg.	Daily Max.	Long Term Avg.
BOD5, mg/L	20.6			
CBOD5, mg/L			13.7	3.0
Chemical Oxygen Demand, mg/L	86		105	28.3
Total Organic Carbon, mg/L	11.5		70	11.7
Total Suspended Solids, mg/L	15		38	4.65
Ammonia, mg/L	27.9		47.5	21.1
Flow, MGD	0.312		0.45	0.15
Temperature Winter °Celsius	13		21.9	12.2
Temperature Summer °Celsius	18		24.3	16.3
pH, Standard Units	Min. = 6.7 Max. = 7.8		Min. = 5.7 Max. = 7.8	
Chlorine, Total Residue, mg/L	2.4		1.18	0.02
Fecal Coliform, /100ml	1250000		220	10
Nitrate - Nitrite, mg/L	16.3		13.7	4.2
Phosphorus, mg/L			2.52	3.15
Alpha, Total, pCi/L	40		8.0	0.5
Beta, Total, pCi/L	48		18.0	12.3
Aluminum, Total, mg/L			2.96	0.757
Barium, Total, mg/L			0.034	0.015
Cobalt, Total, mg/L			0.006	0.0038
Iron, Total, mg/L			0.558	0.122
Magnesium, Total, mg/L			9.21	6.07
Molybdenum, Total, mg/L			0.082	0.015
Manganese, Total, mg/L			0.043	0.031
METALS				
Antimony, Total, ug/L	<5		39	34
Arsenic, Total, ug/L	<5		131	98
Beryllium, Total, ug/L	<5		1	1

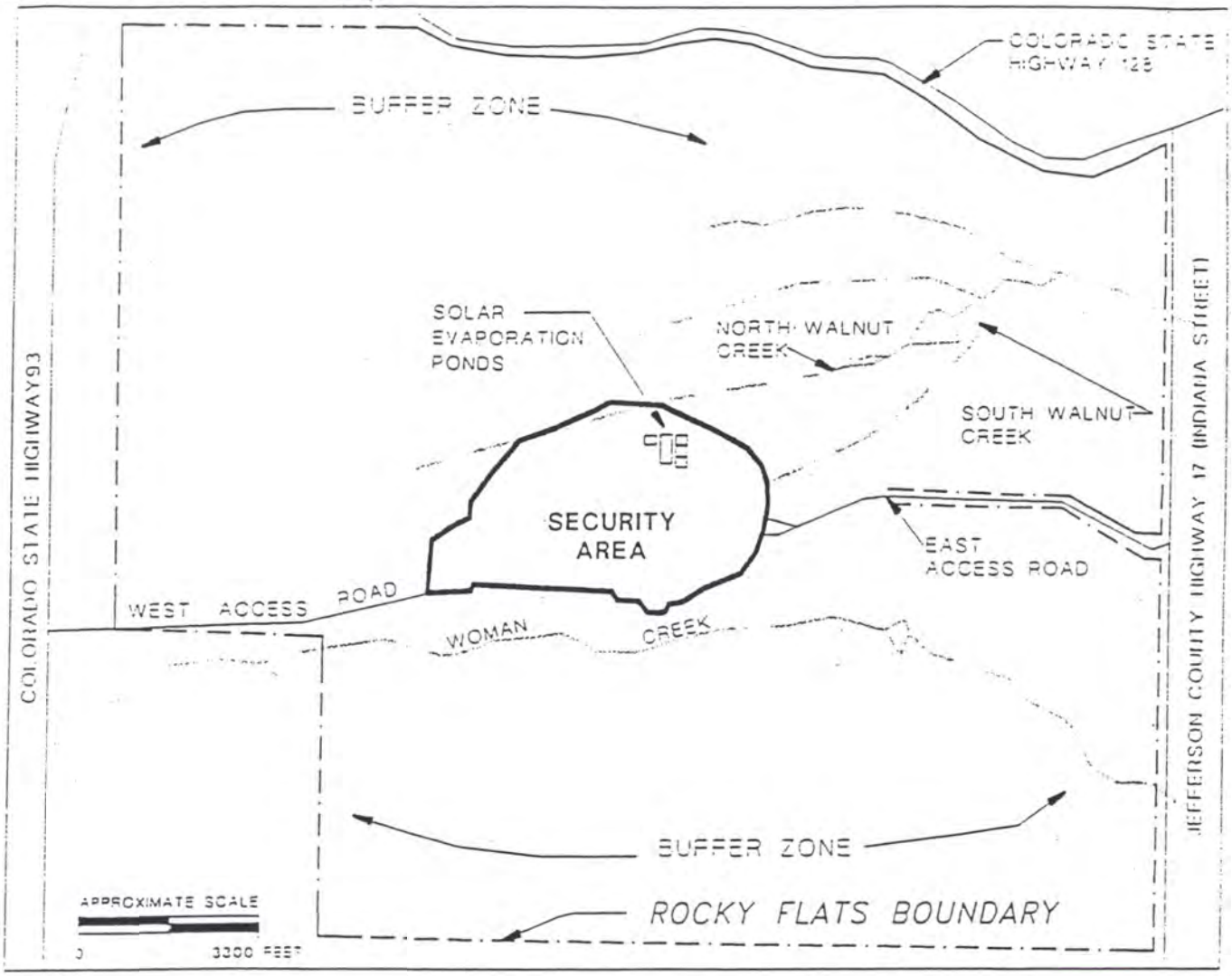
APPENDIX 4. DATA FROM FORM 2C FOR SEWAGE TREATMENT PLANT (Continued)				
	12/27/88 Apl. a/		3/15/93 Apl. b/	
Pollutant	Daily Max.	Long Term Avg.	Daily Max.	Long Term Avg.
Methylene Chloride, ug/L	<5		28	N/A
1,1,2,2 Tetrachloroethane, ug/L	<5		<5	N/A
Tetrachloroethylene, ug/L	<5		<5	N/A
Toluene, ug/L	<5		3.0	N/A
1,2-Transdichloroethylene, ug/L	<5			
1,1,1 Trichloroethane, ug/L	<5		<5	N/A
1,1,2 Trichloroethane ug/L	<5		<5	N/A
Trichloroethylene, ug/L	<5		<5	N/A
Trichlorofluoromethane, ug/L	<5		<5	N/A
Vinyl Chloride, ug/L	<10		<10	N/A

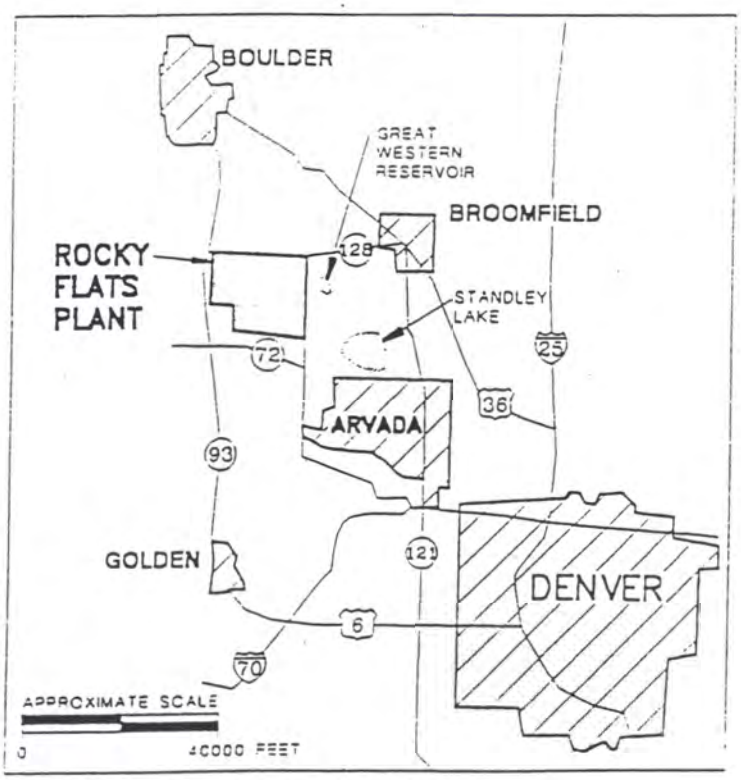
a/ Data from Form 2C submitted on December 27, 1988. The data are for the discharge from the sewage treatment plant and not for the discharge from Pond B-3. Nearly all of the data values are based on one sample.

b/ Data from Form 2C submitted on March 15, 1993, for informational purposes and was not a formal submittal. The data were based on many more samples than in the December 1988 submittal. For metals there were 15 to 66 samples, for the organic there were 30 samples, and for the others there were 116 to 365 samples or readings.

Note 1: In the December 1988 submittal all of the values for the GCMS fractions for acid compounds, base/neutral compounds, and pesticides were less than the analytical detection limits. In the March 1993 submittal all of the compounds in these groups were marked "believed absent".

Note 2: There are significant differences between the values reported for antimony, arsenic, lead, selenium, and thallium in December 1988, and those values reported in March 1993. Some of this difference could be due to a change in analytical methods. The December 1988 analyses were done by atomic adsorption (AA), while the values reported in March 1993 were based on the use of inductively coupled plasma (ICP) analyses.





ADAPTED FROM FIG 1-1 E.G. & G. DRAFT GEOLOGIC CHARACTERIZATION REPORT JAN. 3, 1990.

ROCKY FLATS LOCATION MAP	
DATE: JANUARY 1990	FIGURE 1

4909A55 10/22/91 11:16am AWK

Rocky Flats NPDES Discharge Points and Monitoring Stations

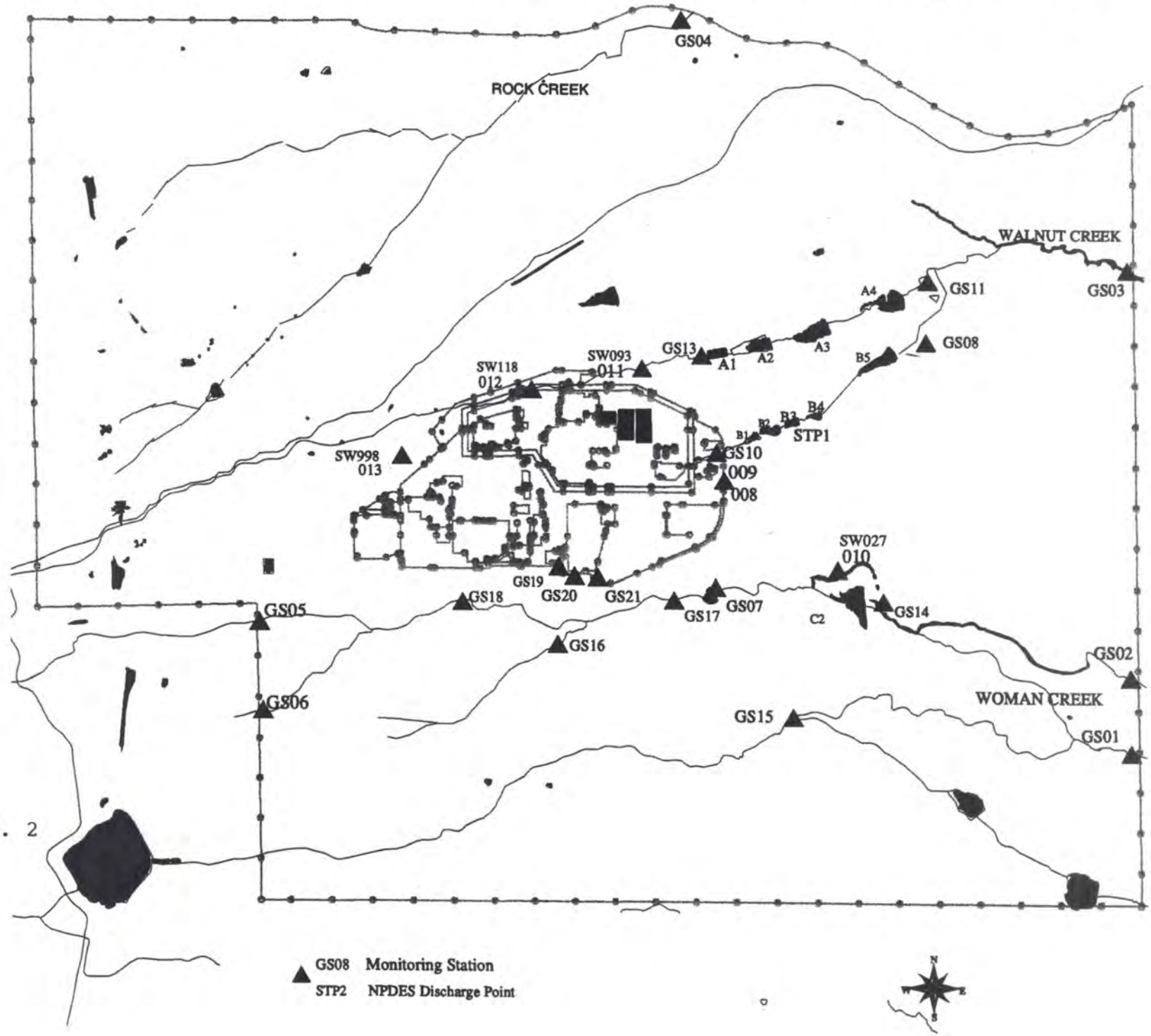
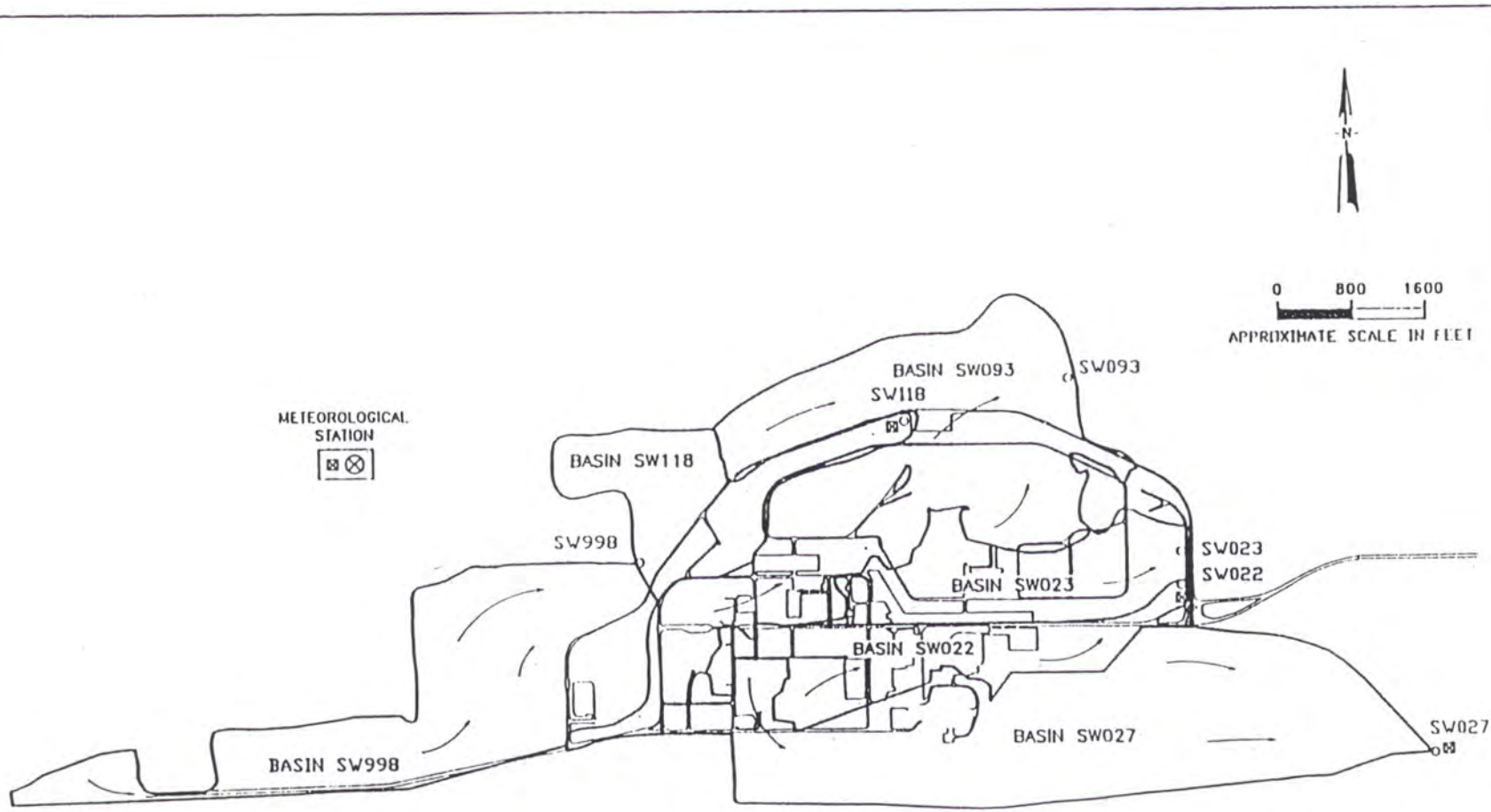


Fig. 2



FF10-1A.DWG

STORMWATER NPDES MONITORING-SITE LOCATION MAP	
DATE: FEB. 1993	FIGURE 3

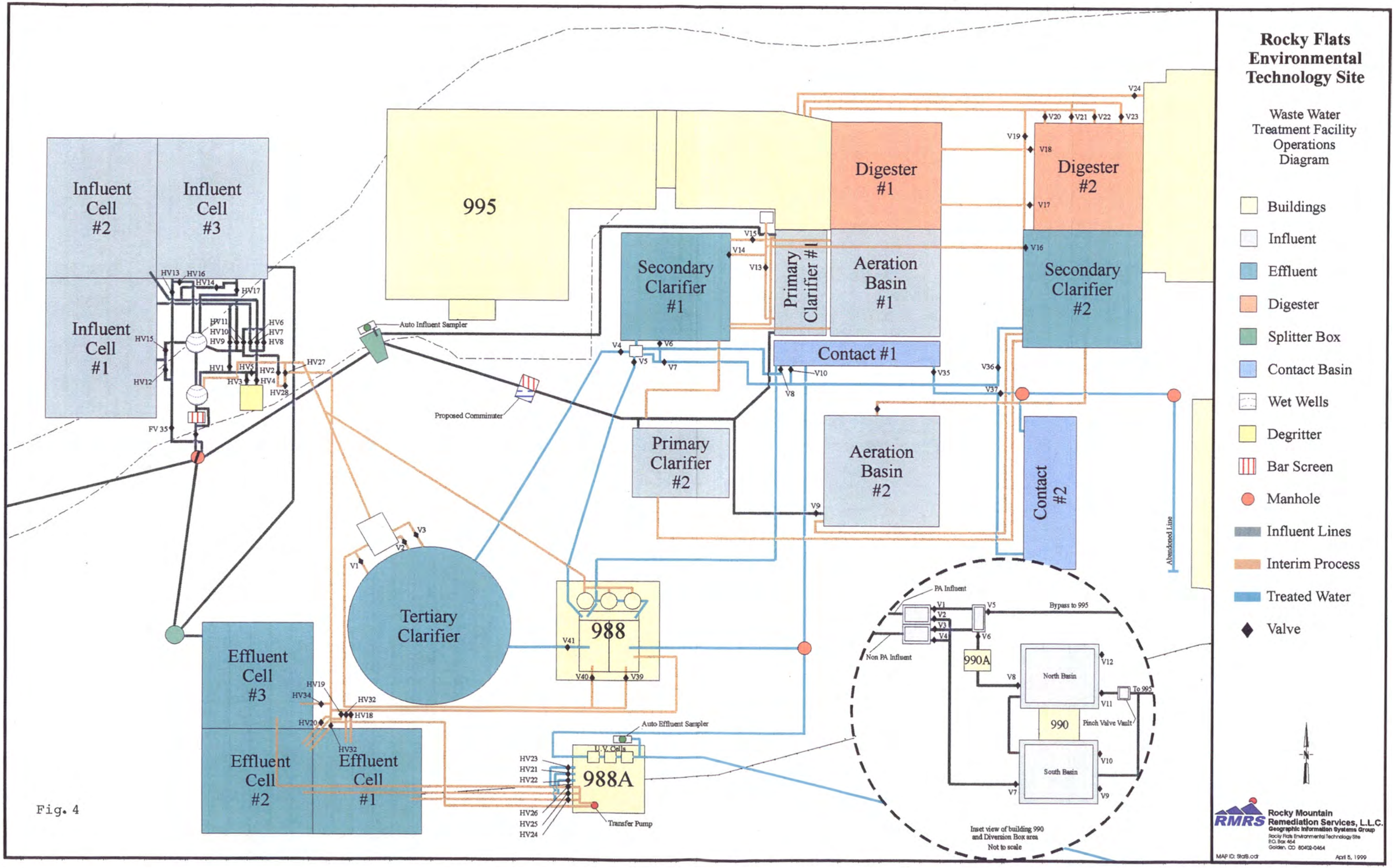

Rocky Flats Environmental Technology Site
Waste Water Treatment Facility Operations Diagram
Buildings
Influent
Effluent
Digester
Splitter Box
Contact Basin
Wet Wells
Degritter
Bar Screen
Manhole
Influent Lines
Interim Process
Treated Water
Valve
Influent Cell #2
Influent Cell #3
Influent Cell #1
995
Digester #1
Digester #2
Secondary Clarifier #1
Primary Clarifier #1
Aeration Basin #1
Secondary Clarifier #2
Contact #1
Auto Influent Sampler
Proposed Comminuter
Primary Clarifier #2
Aeration Basin #2
Contact #2
Abandoned Line
Tertiary Clarifier
988
Effluent Cell #3
Effluent Cell #2
Effluent Cell #1
Auto Effluent Sampler
U.V. Cells
988A
Transfer Pump
PA Influent
Non PA Influent
Bypass to 995
990A
North Basin
South Basin
990
Pinch Valve Vault
To 995
Inset view of building 990 and Diversion Box area
Not to scale
Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464
MAP ID: Stat8.cdr
April 5, 1999

Fig. 4